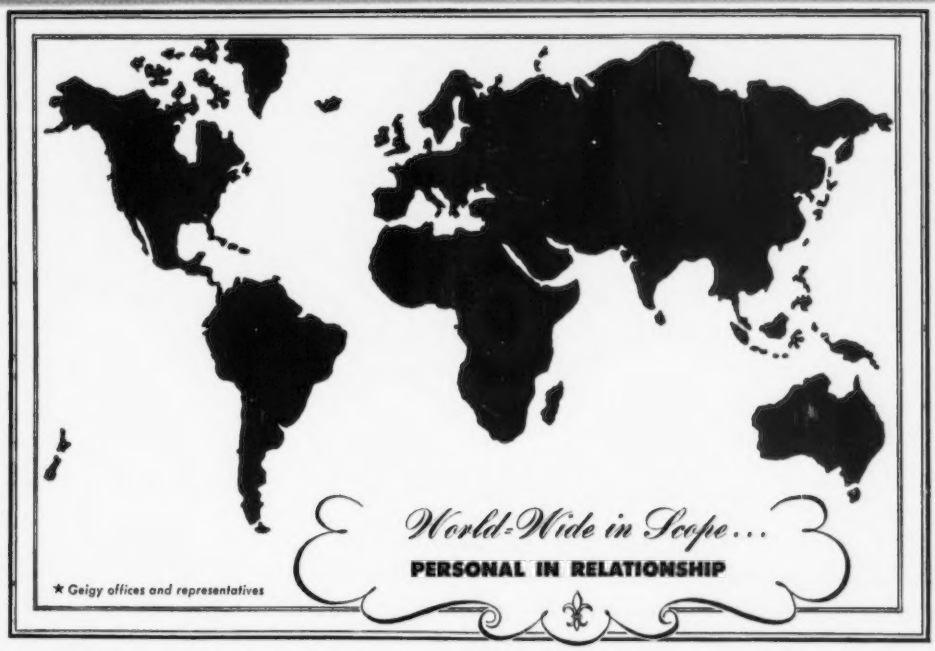
PAPER TRADE
JOURNAL
January 22, 1954

- *An up-to-date review of kraft pulp bleaching.*
- *APPA objects to U.S. financing foreign mills.*
- *Progress reports on new mills and rumors.*



Dyestuffs · Auxiliaries · Pigments · Aniline Inks

FOR THE PAPER MANUFACTURING & CONVERTING INDUSTRY

GEIGY DYESTUFFS
DIVISION OF GEIGY CHEMICAL CORPORATION
89-91 BARCLAY STREET, NEW YORK 8, NEW YORK

Geigy — *dyestuff makers since 1859*

REPRESENTATION IN THE U. S. A. AND CANADA: Appleton, Wis. • Boston • Charlotte, N. C. • Chicago • Los Angeles • New York • Philadelphia • Portland, Ore. • Providence, R. I. • Toronto, Canada

AND THROUGHOUT THE WORLD:

Basle, Switzerland
Medellin, Colombia
San Jose, Costa Rica
Havana, Cuba
Tokyo, Japan
Beyrouth, Lebanon
Mexico City, Mexico
Istanbul, Turkey

Buenos Aires, Argentina
Sydney, Australia
Vienna, Austria
Brussels, Belgium
La Paz, Bolivia
Rio de Janeiro, Brazil
Guatemala City, C. A.
Santiago, Chile

Ciudad Trujillo, Dominican Republic
Guayaquil, Ecuador
Manchester, England
Paris, France
Athens, Greece
Enschede, Holland
Bombay, India
Teheran, Iran

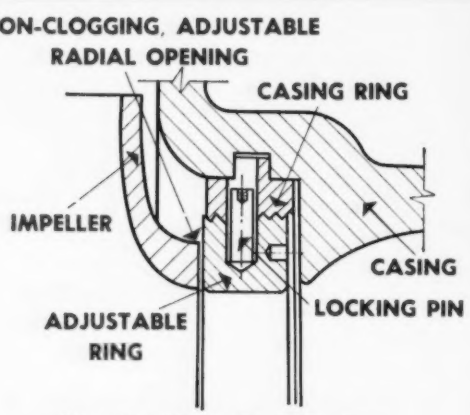
Karachi, Pakistan
Lima, Peru
Manila, Philippines
Porto, Portugal
San Juan, Puerto Rico
Bangkok, Siam
Johannesburg, S. A.
Barcelona, Spain

Montevideo, Uruguay
Caracas, Venezuela
Hongkong, China
Shanghai, China
Tel-Aviv, Israel
Milano, Italy
Norrkoping, Sweden

WEARING RING DESIGN Cuts Fan Pump Costs

- *Adjustable clearance keeps efficiency high*
- *Radial opening eliminates damage from jamming*

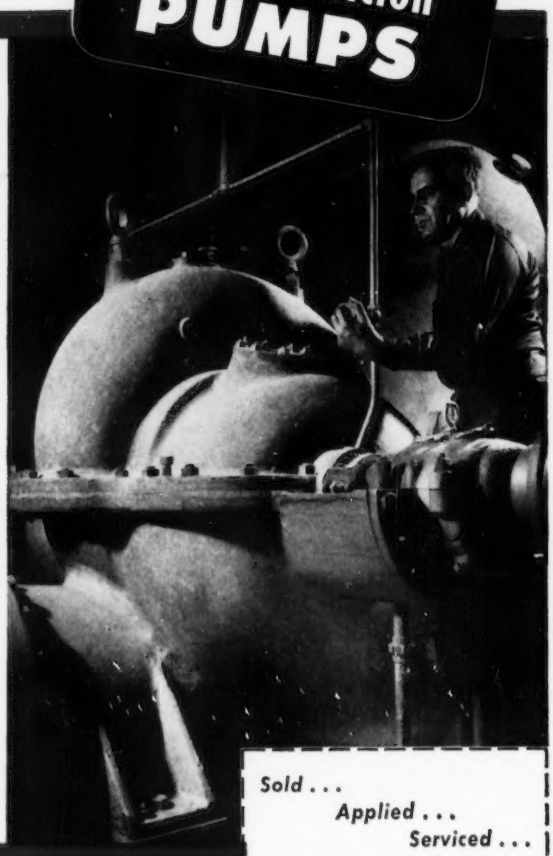
Double Suction PUMPS



Here's How It Works

Clearance between the wearing ring and the impeller can be adjusted by simply removing the locking pin, turning the threaded inner ring until the correct clearance is established and resetting the locking pin. In addition to keeping efficiency high, small clearances also tend to exclude solid materials and reduce clogging problems.

With ordinary wearing rings, solid material between ring and impeller may deflect the shaft or cause the impeller to seize. With Allis-Chalmers wearing rings with radial clearance, solid materials between rings simply increase the load on the thrust bearing slightly and wear themselves free.



YOU CAN GET HELP on all your stock handling problems from an Allis-Chalmers pump engineer. And Allis-Chalmers can supply the complete pumping unit — pump, motor, drive and control — all of coordinated design and manufacture . . . assembled and ready to install.

For more information on Allis-Chalmers pumps for paper mills, call your nearby Allis-Chalmers Authorized Distributor or representative or write Allis-Chalmers, Milwaukee 1, Wisconsin. Ask for centrifugal pump Bulletins 08B6146, 52B7112 and 52B7839.

A-3972

Texrope and *Vari-Pitch* are Allis-Chalmers trademarks.

Sold . . .
Applied . . .
Serviced . . .

by Allis-Chalmers Authorized Distributors, Certified Service Shops and Sales Offices throughout the country.

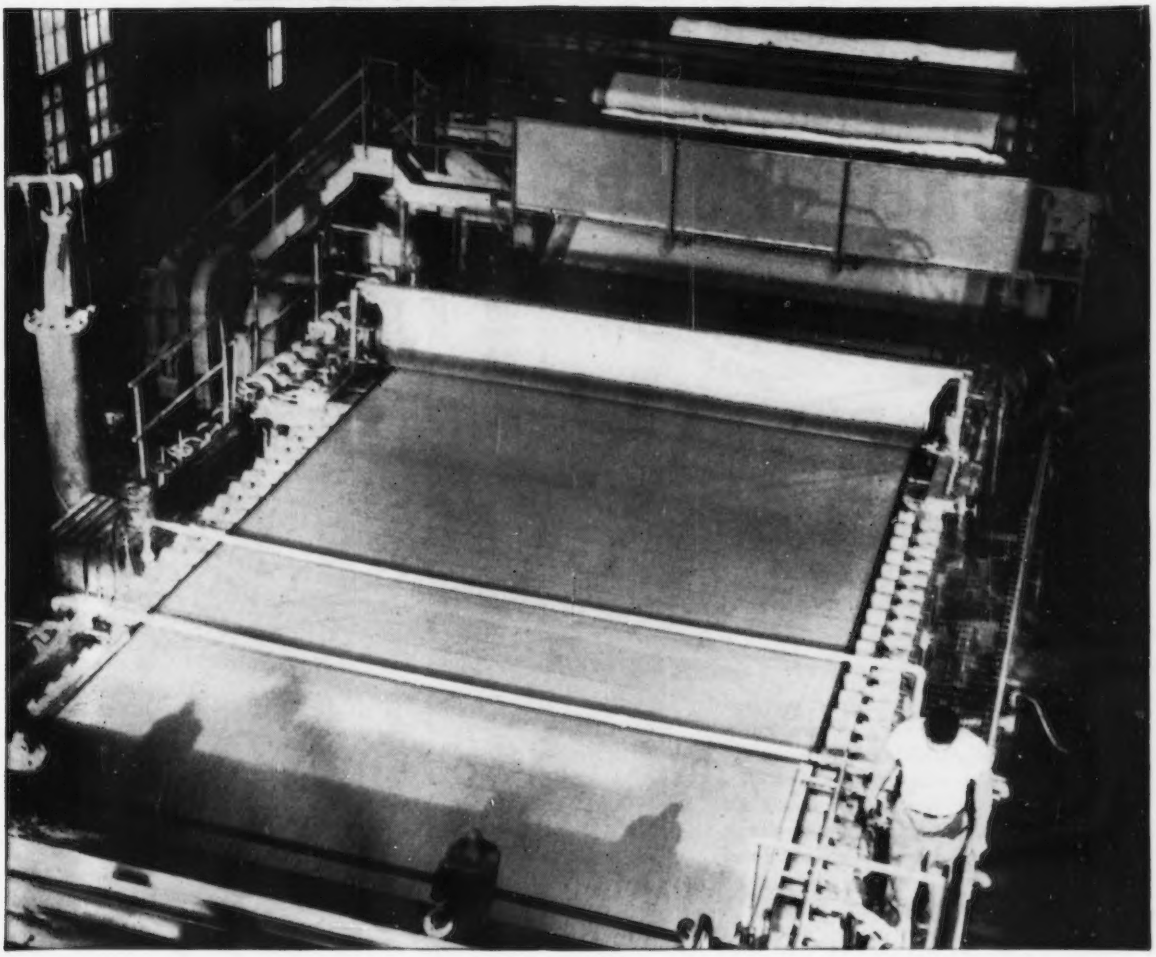
MOTORS — ½ to 25,000 hp and up. All types.

CONTROL — Manual, magnetic and combination starters; push button stations and components for complete control systems.

TEXROPE V-belts in all sizes and sections, standard and *Vari-Pitch* sheaves, speed changers.

ALLIS-CHALMERS

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Fewer spots, better paper formation with B. F. Goodrich table rolls

You can get more even formation and fewer spots on the sheet if your Fourdrinier is equipped with B. F. Goodrich Dukbak table rolls. Water clings to the surface of ordinary rolls and is carried on around and thrown against the lower side of the wire. But with B. F. Goodrich table rolls this can't happen—water can't stick to the special rubber on Dukbak rolls—it is cast down and away from the wire.

And because Dukbak table rolls are ground straight and true, they move evenly with the wire without developing high or low spots. The wire is kept perfectly level. The sheet you produce is smooth and uniform.

Fast, uniform production is especially important in the making of fine paper. And the Hammermill Paper Company's 180" Fourdrinier (shown above), equipped with Dukbak table rolls, is setting new standards for speed and quality.

In addition to better performance, B. F. Goodrich Dukbak rolls have many other cost-saving advantages. Corrosion is impossible because the ends are sealed against moisture, and after years of hard service, Dukbak rolls can be reground as good as new.

For more information on these long-lasting B. F. Goodrich rolls which will improve the quality of your paper, send in the coupon. And if you are buying a new Fourdrinier, be sure to specify Dukbak to your machine builder.

The B. F. Goodrich Company
Dept. M-138, Akron 18, Ohio

Without cost or obligation, please
☐ send information on paper mill rolls.
☐ have a representative see me.

Name_____

Company_____

Address_____

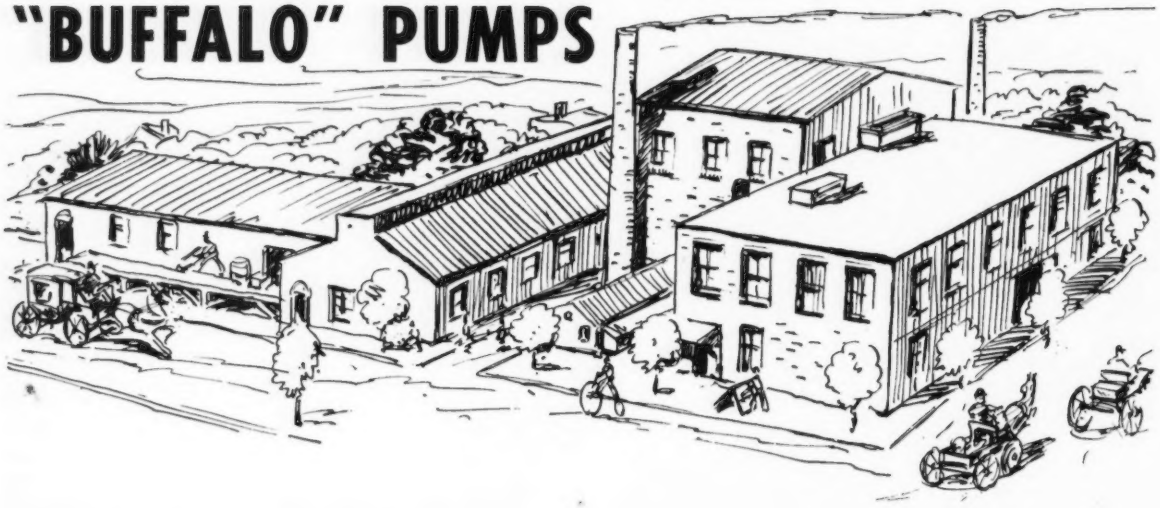
_____

B.F.Goodrich
INDUSTRIAL PRODUCTS DIVISION

Since "WAY BACK WHEN"...

Industry has depended on

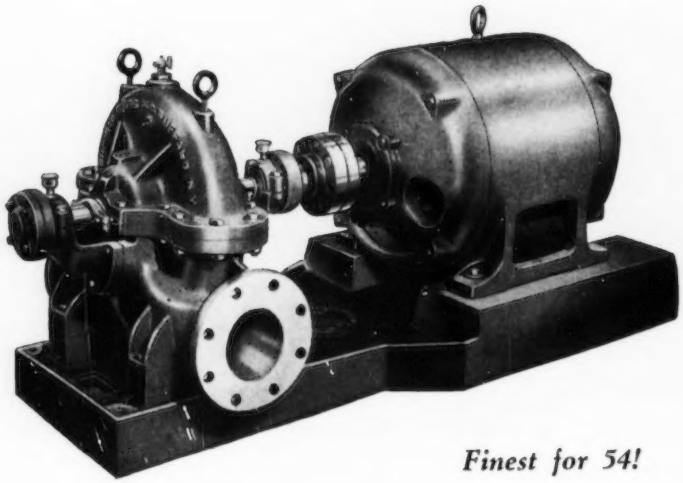
"BUFFALO" PUMPS



Long before electric motors powered pumps, the then Buffalo Steam Pump Company was already building some of industry's most respected pumps. Respected, because "Buffalo" engineers and craftsmen started out to build pumps that *wouldn't* need a lot of attention and repairs—and would still be on the job twenty and thirty years later.

They've adhered to that idea ever since—passing their know-how on to their followers—always keeping close contact with requirements in the field—making never-ending improvements. Today, you can pick a "Buffalo" Centrifugal Pump with the full assurance that it embodies every known feature for the most efficient and trouble-free service possible.

Anyone can build a pump that will move a liquid. Yet, doesn't it make sense to buy the pumps of a manufacturer who has specialized in quality pumps, and pumps alone, since "way back when"?



Finest for 54!

For handling clear water in capacities from 10 to 14,000 gpm, this "Buffalo" Type "SL" Double Suction Pump has no equal for efficiency, easy maintenance and long life. Widely used in power plants, air conditioning and air washer service, paper and textile mills. Write for Bulletin 955-P.

"Buffalo" PUMPS

BUFFALO PUMPS, INC.

159 Mortimer St. Buffalo, New York

Subsidiary of Buffalo Forge Company
Canada Pumps, Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

SUBSCRIPTIONS

U. S. $5.00 per year to pulp and paper mill personnel, others $7.50. U. S. Possessions and Canada $7.00. Latin American Countries $15.00, all others $20.00. Single copies of regular editions are 25c.

Published every Friday by LOCKWOOD TRADE JOURNAL CO., INC., 15 West Forty-Seventh Street, New York 36. Phone: PLAZA 7-2370.

JOHN C. W. EVANS
EDITOR

D. BRUCE OTIS, JR.
ASSOCIATE EDITOR

E. P. NUTTALL
ASSOCIATE EDITOR

R. E. THUEMMES
MANAGING EDITOR

Entered as Second Class Matter at the post office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 North Crystal St., East Stroudsburg, Pa. Printed in U.S.A.

Copyright 1954 by Lockwood Trade Journal Co., Inc.

Paper established Feb. 17, 1899, combined with *Paper Trade Journal* Nov. 16, 1899. *Paper* established Sept. 21, 1910, combined with *Paper Trade Journal* February 19, 1926.

All rights to the above titles reserved. Contents of *Paper Trade Journal*, including all articles, illustrations, etc., are copyrighted and may not be reprinted except by permission.

Paper Trade Journal is indexed in Industrial Arts Index and Engineering Index. Also publisher of Lockwood's Annual *Directory of the Paper and Allied Trades.*

REMEMBER THESE DATES

JAN. 27-29, 1954: Technical Section Annual Meeting, C.P.P.A., Sheraton-Mount Royal Hotel, Montreal, Que.

FEB. 14-19: Annual Meeting, APPA, Waldorf-Astoria Hotel, New York, N. Y.

FEB. 15-18: Thirty-ninth Annual Meeting, TAPPI Commodore Hotel, New York, N. Y.

JUNE 21-23: National Meeting American Pulp and Paper Mill Superintendents Assn., Sheraton-Mount Royal Hotel, Montreal, Que.

PAPER TRADE JOURNAL

Published Weekly Since 1872

JANUARY 22, 1954, *Vol. 138, No. 4*

October Start-up Forecast for East Texas Pulp & Paper Co. 9

Weyerhaeuser Opens Fiberboard Plant in Oregon 10

New Board Mill Now Running in Lawrence... 10

Further Facts Revealed On Planned B. C. Mills 10

Kraft Pulp Bleaching 14

A rapid run over of all the important points on and new developments in kraft pulp bleaching by one of the industry's experts.

APPA Opposes U.S. Financing of Foreign Mills 22

Summary of a brief presented before a citizens committee of the Senate Banking Committee.

Local Meetings Calendar 26

19th Annual Kalamazoo Valley Meeting 27

DEPARTMENTS

Trends	7	Prices	35
News of the Week	9	Prices of Materials	35
Paper People	12	Obituaries	37
News of Associations	26	Production Ratio	38
New Equipment and Supplies	30	ADVERTISERS INDEX	50
CLASSIFIED ADVERTISING	39		

LOCKWOOD TRADE JOURNAL CO., INC., 15 W. Forty-Seventh St., N.Y. 36

Phone: Plaza 7-2370

GEORGE E. LOCKWOOD, President and Treasurer — ARTHUR E. GORDON, Vice-President — FREDERICK E. WINKLER, Secretary

Wherever Drip, Splash or Squeeze-out Is a Problem

Use SUNTAC

Suntac Oils stay put, leave no gummy residue. They are ideal for lubricating gears, sprockets, chains, cables, couplings, linkages and bearings where throw-off must be avoided. Call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. PT-1.

INDUSTRIAL PRODUCTS DEPARTMENT
SUN OIL COMPANY

SUNOCO®

PHILADELPHIA 3, PA. • SUN OIL COMPANY LTD., TORONTO & MONTREAL

TRENDS

PAPER TRADE JOURNAL

No Fear Of Downward Spiral

Industry reception of the gloomy forecasts of the nation's economists is one of respect and consideration. On the whole, it could be summed up in the one-time punch line: "A wonderful opportunity for someone; somebody else, not me."

Specifically it appears that business men here see the reasonable possibility of a universal inventory adjustment that could develop into a downward spiral were it permitted to take its course. But they do not view it as inevitable. They do not fear it for their own company.

The Downward Spiral. Fear of a downward spiral in the U.S. economy has inspired an extremely pessimistic view which National City Bank's January letter seeks to examine.

"The principal question for 1954 is whether falling orders, starting with even modest inventory adjustments and modest declines in various categories of demand will spiral into reduced employment, falling purchasing power, and curtailment feeding on itself.

"It is true," says the Monthly Letter, "that inventory reduction produces spiraling tendencies; and inventory changes have long been recognized as one of the most powerful causes of business fluctuations. Whether the spiral will go 'on and on of its own accord' is another question. Obviously it always stops at some level, and the influences which will determine the stopping point vary greatly at different times.

"In many other postwar years there have been foreseeable gaps in demand and fears of a spiraling decline. But the gaps have been filled, and the threatened spiral has been averted or arrested. This does not mean that sheer optimism and complacence can make 1954 a year of further growth. On the contrary, it promises to be a year of adjustment, stiff competition and moderate recession, as compared with 1953. It is plain, however, that the predominant sentiment of this country has little fear of such grave developments" as those depicted by Colin Clark, the noted Australian economist and spokesman of the extreme pessimistic view.

Outlook Exudes Confidence. Each week of the new year has sustained the edge of optimism over pessimism at the various trade conferences. For the individual company, men believe their sales and advertising plans are aggressively progressive. Paraphrasing one business writer: If this be the recession, no one is going to acknowledge it for his company.

The business outlook exudes confidence in America's future. It holds promise of a good level of business for those who will work for it on a keenly competitive market in which advertising will do a hard selling job.

See 10% Rise In 1954's Ad Volume

Advertising men look for an estimated 10 percent rise in advertising volume over the peaks of 1953, according to a study in circulation and rate trends just released by the Assn. of National Advertisers, Inc.

Appliance Men Boost Budgets. Manufacturers who will spend more for 1954 advertising report budget increases up to 50 percent over 1953.

Out in front in their efforts to induce consumer buying through stronger promotion efforts are the appliance and furniture men. Reported rises range from the 50 percent scheduled by Norge for consumer and business magazines, to Heywood-Wakefield's 10 percent rise in magazine budget for furniture. Laundry equipment, refrigerators, TV and appliances are in the group. For its appliance advertising in 1954, Admiral Corp. has set aside $6.5 millions, the largest sum thus expended in that company's history. The rise scheduled by U.S. Steel Supply Div. amounts to 100 percent.

Newspaper Ads At Peak. Intensive selling of newspaper advertising in the year ahead will be needed to hold volume to current peaks, newspaper advertising executives were told at their annual meeting this week.

National newspaper advertising has shown gains for 12 years: the number and variety of advertisers are the greatest ever, and newspaper circulation has never been in a healthier condition, the group was told by Arthur A. Porter, vice-president of Leo Burnett Co., a Chicago advertising concern.

Newsprint Market Dependent On Advertising Plans

What's ahead for the newsprint market depends on how well these advertising plans crystallize. On the whole, the newsprint industry's men anticipate that U.S. consumption will hold well in 1954, perhaps see a slight increase over 1953 levels.

To some, cycles of downward business adjustment mean stepped-up newspaper advertising aimed at drawing out consumer dollars. One industry spokesman however points to the pattern of automobile advertising which must be considered a power in linage. Most automobile manufacturers relate the advertising to actual sales, he said, not prospective sales. Their budgets are predicated on the number of cars they expect to manufacture, with a per capita figure per car. If the production of cars is to be curtailed quite drastically, a lower newspaper advertising volume would result.

U. S. Consumption Gains. Newsprint consumption in the U.S. during the year 1953 amounts to an estimated 6,142,897 short tons, a 2.6 percent gain over the year 1952, 3.5 percent over 1951, according to statistics of the American Newspaper Publishers Assn.

Canadian Output Peak. North American output of newsprint paper in 1953 amounted to 6,805,278 tons, of which 5,721,296 tons were made in Canada, 1,083,892 tons in the United States. For Canada, this represents an all-time high with a gain of 34,245 tons or 0.6 percent over 1952. U.S. output of 62,882 tons dipped 5.5 percent from 1952's record, and represented marginal mills which are now out of the production.

Production Prospects. New production in Canada and the U.S. this year could add a possible 150 to 200,000 tons of newsprint paper to North American production this year.

In addition to the Bowater's Tennessee mill which is due to roll in April, there is the new machine at Great Northern Paper Co., and an additional machine at St. Lawrence Corp's. Red Rock mill. Whether the new output is 150 or 200,000 tons will depend on when the machines reach full rated capacity. But such an addition to 1953's North American output of 6,805,278 tons raises the burning question of whether the U.S. market will absorb this added tonnage or whether more will be available for the export market.

Price Is Stable. Prices in the opinion of Powell River Co. Ltd., a major Canadian producer are now stabilized and production is equal to demand.

In view of supply-demand factors of today's somewhat uncertain market, industry sources here do not see any newsprint price rise on the horizon. Neither do they envisage an over-supply condition which would threaten market stability.

—E.P.N.

Paperboard Production (Tons)*

	Jan. 9 1954	Jan. 2 1954	Jan. 10 1953
Production	212,013	103,430	233,208
New Orders	230,479	185,853	164,000
Unfilled Orders	414,047	392,425	284,560
% of Activity	78	43	83

* Source: National Paperboard Assn.

For the finest quality finish... specify "U. S." Roll Coverings

Imparting the finest finish to paper requires the right kind of roll covering with the ability to "run clean" and not pick up fiber. This goal is achieved in "U. S." Rolls because the "U. S." engineers build into them the proper resilience, correct and uniform hardness, smoothness of grain. United States Rubber Company engineers carefully go over the customer's needs. They study operating conditions, speeds, working pressures, types of stock—to make sure they specify the best.

So, for paper of the finest quality finish, *and* strength, investigate "U. S." Roll Coverings. Write to address below.

"U. S." Research perfects it · "U. S." Production builds it · U. S. Industry depends on it.

US RUBBER

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION · ROCKEFELLER CENTER, NEW YORK 20, N. Y.

Hose • Belting • Expansion Joints • Rubber-to-metal Products • Oil Field Specialties • Plastic Pipe and Fittings • Grinding Wheels • Packings • Tapes Molded and Extruded Rubber and Plastic Products • Protective Linings and Coatings • Conductive Rubber • Adhesives • Roll Coverings • Mats and Matting

WEEK OF PAPER TRADE JOURNAL JANUARY 22, 1954

October Start-up Forecast For East Texas Pulp & Paper Co.

In a special report to *Paper Trade JOURNAL*, R. M. Buckley, executive vice-president, East Texas Pulp & Paper Co., reveals that the company's new chlorine dioxide bleached kraft market pulp and paperboard mill at Evadale, Texas is ahead of its construction schedule and is due to start production October 15, 1954. Over 800 men are now employed in the construction work.

Mr. Buckley reports that this earlier starting date "has been made possible through our being favored with good construction weather and faster equipment deliveries on the part of our suppliers, together with a rapid build up of our construction force to take advantage of these factors."

Originally scheduled for start-up in late 1954, the 300-ton per day operation features a Solvay Chlorine dioxide process for bleaching its kraft pulp production and a Beloit 216-inch fourdrinier paper machine, adaptable to simple changeover from pulp to board production.

According to Mr. Buckley, the construction schedule for specific projects is well established: "Erection of structural steel will commence early in February on the machine room, recausticizing plant, power and recovery units, screen room, and pulp group of buildings. We will start installation of the fourdrinier April 1st, and other equipment stimultaneously."

LOOKING NORTH OVER THE EVADALE MILL SITE—Construction progress of East Texas Pulp & Paper Co. as of January 1st reveals the office building (lower right), finished product warehouse (lower foreground), machine room foundation and form work (immediately north of product warehouse), equipment warehouse, shop, and stores buildings (north of stock). East of main road from south to north are screening, pulp, and digester group; then recausticizing and chip silo foundations; then cement mixing plant.

Gardner Buys Units for Paper Mill and Subsidiary

The directors of Gardner Board and Carton Co. recently approved an appropriation of $200,000 for the purchase of a Shartle Brothers' hydrapulper system for its board mill in Lockland, Ohio. The hydrapulper will prepare filler stock and will be a 20-foot unit with capacity of 200 tons. The Lockland carton plant will also receive a new glueing machine.

At the same time, the directors appropriated $25,000 for building a new type of can-packaging machine, which will be manufactured by Gardner's subsidiary, The Manchester Machine Co. The machine is a Gardner development for packaging carry-home cartons of beer cans.

APPA Condemns Japan's Alaskan Pulp Venture

The American Paper and Pulp Assn. has labelled as "economically unsound" the widely publicized plan to allow Japanese industrialists to construct a dissolving pulp mill in Alaska. The Association is asking the U. S. Government to reject the Japanese proposals as "a serious violation of a public trust." APPA's request was submitted to the Citizens Advisory Committee of the Senate Banking and Currency Committee.

It was pointed out that completion of the Japanese plan would further expand an industry "that is already seriously over-expanded" and would be instrumental in "destroying the very markets that the domestic wood pulp industry has been expanding its facilities to serve."

One of the objectives of the Alaska Pulp Co., recently incorporated in Sitka, Alaska is the production of dissolving pulp from wood cut from publicly-owned Alaskan forests, and its shipment to Asian consumers. The APPA protest states that the Japanese proposal is unsound economically because "there is already an oversupply of dissolving wood pulp on a world basis."

"North American pulp producers," the statement added, "are ready, willing and anxious to negotiate long-term contracts with all comers. Including the Japanese, for all of the additional dissolving wood pulp that they can possibly use. New productive facilities have been installed by private industry at great cost for the specific purpose of supplying these prospective demands. If duplicate facilities are installed for the same purpose, with the connivance of our own Government, the inevitable result will be a wholesale destruction of economic values that North American venture capital has so boldly created."

Weyerhaeuser Opens Fiberboard Plant in Ore.

Construction is finished, and full production of specialized fiberboards has begun at Weyerhaeuser Timber Company's new plant in Klamath Falls, Ore. The plant is an L-shaped building adjoining the company's pine saw mill and box plant.

With a listed capacity of 90 million square feet of fiberboard per year on a one-eight-inch thickness basis, the mill will produce a variety of board products, including hardboard, facing board, decorative board, floor underlayment, and industrial board. It is said the output will include a variety of thicknesses and densities extending beyond the range of conventional fiberboards. Thicknesses of board will range from 1/16 inches to 3/8 inches; specific gravities will range from .32 to 1.23.

A rather unique development in the product lines of this mill is moldable board which is expected to find many tailor-made uses as laminate and facing over various core materials.

As a fiber source, the mill utilizes white fir timber (abies concolor), which has long been mostly waste stands in the firm's woodlands. Cuttings from these stands and residues from the sawmill furnish chips which are fiberized by the Asplund process. Formation of the board is a dry process, utilized for the first time to make hardboards from defibrator wholewood fibers. Additives can be introduced during the fiberizing process to produce the various tailored boards. The prepared fibers are continuously felted from air suspension, then hot-pressed into boards, humidified to prevent warpage, trimmed, and cut to specificed size.

Among the Weyerhaeuser personnel responsible for the development work leading to the construction of this plant and for its current operations are Clark C. Heritage, director of development, Robert D. Pauley, manager of special products division; Hugh B. Campbell, Klamath Falls branch manager; John G. Robinson, superintendent of hardboard plant.

Generally, Weyerhaeuser hardboards will go to four classes of customers: retail lumber dealers, distributors, industrial firms who will use it in their products, and to fabricators who will cut, shape and process the board for industry.

Two Sides Revealed in Bowaters Gas Dispute

The Chattanooga Gas Co. and the Tennessee Gas Co. have intervened in opposition to the application of the East Tennessee Natural Gas Co. to supply 9 million cubic feet a day of interruptible gas to Bowaters Southern Paper Corp. at Calhoun, Tenn.

W. D. Spears, attorney for Chattanooga Gas, stated at the Federal Power Commission hearing that the East Tennessee company officials tell the distributors who ask for more interruptible gas that they don't have any available. "So we have to deny our customers," Spears said, "and now they propose to make 9 million feet available to Bowaters on Feb. 1."

V. J. Sutton, mill manager of Bowaters, said the $55,000,000 plant will be absolutely stymied if natural gas is not available to it by Feb. 1.

Guy L. Henry, president of East Tennessee Natural Gas Co., stated in rebuttal that his firm has sufficient gas supplies to furnish Bowaters Southern Paper Corp. up to 9,000,000 cubic feet daily.

Henry declared his company is able to meet all firm demands of its wholesale customers in Tennessee. The interruptible supply to be sold to the paper company would not hamper its service to other customers he said.

He added that the Bowaters contract, signed almost two years ago, would permit East Tennessee to interrupt service to the company without halting interruptible gas service to other customers.

Paper and Board Production

According to the American Paper and Pulp Association, the ratio of United States paper production to mill capacity for the week ending January 9, 1954, was 94.4 percent, compared with 68.5 percent revised, for the preceding week. The ratio was 95.2 percent for the corresponding week a year ago. Mills producing newsprint exclusively are not included.

The paperboard production ratio for the week ending January 9, 1954, was 78 percent, compared with 43 percent for the preceding week, and 83 for the corresponding week last year.

(Detailed statistics on page 38.)

New Board Mill Now Running in Lawrence

The Board Mill Division of A & P Corrugated Box Corp. has begun operations on its recently installed 123-inch trim cylinder board machine. This newest addition to New England board production is located at 250 Canal St., Lawrence, Mass. J. S. Brookover is general manager of the mill and A. S. Boyers is superintendent.

Mr. Brookover has reported to us as follows:

"We will produce all grades of set-up, folding boxboard and specialties. The unit consists of a three way stock system containing three Dilts hydrapulpers, two hydrafuges, two classifiners, and two air thickeners, made by Shartle Brothers Machine Co. Our refining equipment consists of two Noble & Wood unifiners, two Miami jordans and one Shartle hydrafiner. The machine consists of seven 42" cylinders four sets of primary presses, and three main presses of which two are suction. The machine contains ninety-nine 42" diameter dryers, two stacks of calenders and a Hamblet Duplex Cutter.

President and secretary of A & P Corrugated Box Corp. is Morris Appel. J. G. Berman is vice-president and treasurer.

Further Facts Revealed On Planned B. C. Mills

Reports which have been circulating for some considerable time regarding the establishment of a pulp mill in Prince George, British Columbia, are given further confirmation by E. G. Rowebottom, Deputy Minister of Trade and Industry, who said American interests are proceeding with surveys in the central British Columbia area, and there is further likehood that a pulp mill would be established.

Mr. Rowebottom declined to reveal the name of the company or the proposed location of the plant, but stated that power resources would have to be provided first. He added that the cost of the projected mill would exceed $20 million.

There are no immediate plans for hydro construction in the Prince George area, but a new gas line from the Peace River area has been proposed and could be used as a power source. While Mr. Rowebottom did not place the new plant at Prince George, indications from other sources suggest this possible site.

Hon. Robert Sommers, Minister of Lands and Forests, indicated recently that interests from eastern Canada were planning a pulp mill on Vancouver Island at a cost of from $30 million to $40 million. It is believed that this plant would be located near Duncan.

Ten Paper Firms Termed "Excellently Managed" in 1953

Ten paper companies have been certified as "excellently managed" by the American Institute of Management, New York. Seven of them received the award for the fourth consecutive year: Crown Zellerbach Corp., San Francisco; Champion Paper & Fibre Co., Hamilton, Ohio; Great Northern Paper Co., Boston; Marathon Corp., Menasha; Wis.; West Virginia Pulp & Paper Co. and St. Regis Paper Co., both of New York, and Scott Paper Company, Chester, Pa.

For the third time in as many years, Kimberly-Clark Corp., Neenah, Wis., received the AIM award; and the Brown Co., Berlin, N. H., obtained it for the second time. Olin Industries, Inc., was termed "excellently managed" for the first time by the Institute.

According to Jackson Martindell, president of the Institute, only 348 companies in the United States and Canada, out of the 3,000 leading concerns whose methods were studied by that non-profit foundation, were found eligible to receive the designation for the year 1953.

"Recognition of superior management in particular companies is the first step in improving corporate practices generally throughout the country," the AIM official said. "Our continuing studies show the cumulative effect of these awards, which have helped to introduce new and better policies in the top levels of many business organizations.

"The philosophy behind these awards is to focus attention upon those companies whose practices should be emulated by others, to increase efficiency and insure stability for employees, shareholders and the economy as a whole."

New Sutherland Disposal Plant Now Going Up

An item in the *Sutherland News* reports that by the middle of next June, the five million gallons used daily in the board mills of Sutherland Paper Co. are going to be poured back into the Kalamazoo River almost pure enough to bathe in.

In reply to an order to stop pouring polluted mill-waste water into the river, Sutherland, with the help of Miller-Davis Construction Co., is building a mill waste disposal plant to purify waste, pour sludge back into the board mills, and send water with only five to 10 per cent solids into the Kalamazoo River.

The disposal plant, located behind Division 10 near the river, will have a tank 100 feet in diameter capable of processing 5,000 gallons of mill waste each minute. The plant will be run to clarify five million gallons each day.

The project will include closing off open sewers leading directly to the river from the board mills, routing them into the clarification tank and back into the board mills. Sutherland's Board of Directors has appropriated $300,000 for the project.

Scott Employee Conference Meets at Oconto Falls

Employes of the Marinette Paper Co. plant and the Falls Paper & Power Co., Oconto Falls were the hosts to the Personnel Division of Scott Paper Co. in its annual conference in Hotel Marinette, Marinette, Wis., the week of January 10.

Scott Paper Co. executive personnel managers, their assistants and many personnel staff men attended the conference. 1953 progress and programs were reviewed and activities for 1954 were planned. The main subject under consideration was the personnel division's contribution to the $300,000,000 sales goal by 1958.

Roderick H. Sears, Marinette plant manager, welcomed the conferees at the first session, which keynoted the conference. George Clossay, Marinette plant personnel manager, was chairman of one of the sessions, as was Sherman Tibbetts, Falls personnel manager. Thomas Karlen, assistant personnel manager at Marinette, was in charge of housing, banquets, transportation and acted as secretary of the conference. Rober Blunden, Marinette safety supervisor, took charge of tours, which included a tour of the operations at Oconto Falls, a tour of the Marinette plant, including the recently completed converting building, and a fire fighting demonstration and visit to the Ansul Chemical Company plant.

Baldwinville Mill Suffers $100,000 Fire Loss

Two persons were injured and $100,000 damage was caused January 6 by a blaze in the Baldwinville Products Co. plant, Baldwinville, Mass. The concern was formerly known as the A. L. Adams Paper Co.

According to fire officials, the flames started from an overheated bearing in the mill and spread rapidly through the machine and the building producting dense smoke. The damage estimate given by Alva L. Smith, head of the concern, is due to the high cost of the machinery ruined. The gearing system and belting of the mill were heavily damaged. The loss is partially covered by insurance.

The plant, which employs 50 persons on a 24 hour basis in the manufacture of tissue for napkins and similar products, will be closed at least a month while repairs are made.

Nepco Foundation Announces 1954 Scholarship Program

John E. Alexander, Nepco Foundation president, Port Edwards, Wis., has announced that a maximum of four new awards will be made again this year under its scholarship awards program. Eligible for awards under this program, which was first announced in 1953, are employees and children of employees of Nekoosa-Edwards Paper Co., and children of residents of Port Edwards and Nekoosa, regardless of place of employment. Each award is for $750 for an academic year, with a provision for renewal for three additional years.

Four local students are presently attending college with the help of awards made last year. They are Margaret Gilson, Viterbo College, LaCrosse; Claude Schneider, Layton School of Art, Milwaukee; Robert Votava and Keith Buchanan, University of Wisconsin at Madison.

Application forms for the 1954 program will be available between January 18 and February 13 at the Nekoosa-Edwards personnel office in Port Edwards. Completed applications are due back on or before February 27. Complete text of the program is enclosed.

Foster Buys Flagg-Utica Plant

T. Stewart Foster, president of the Foster Paper Company, Utica, N. Y., has purchased a two-factory building from Flagg-Utica Corp. for $22,500. Mr. Foster declined to reveal what use would be made of the structure.

The building, which is adjacent to Foster Paper, was used until November by Flagg-Utica for the manufacture of paper boxes. Mr. Foster said the purchase included the equipment.

A spokesman for Flagg-Utica said his company had transferred some paper box operations to another location in Utica.

PAPER PEOPLE

G. B. Creamer

Named Technical Service Manager for Rayonier

Dr. George B. Creamer has been named manager of Technical Services for Rayonier Incorporated. He replaces Dr. Maurice E. Kinsey, who has resigned to take a position with another company.

In his new position Dr. Creamer is primarily responsible for supplying assistance to cellulose users in the application of Rayonier pulps to their needs. He will report to the manager of sales, Michael A. Brown. Prior to his advancement, Dr. Creamer was a research supervisor at the company's Research Division at Shelton, Wash.

Navigato Switches from Buckbee to Chicago Paper

Ben Navigato has now joined the Industrial Sales Force of Chicago Paper Co. and will contact the Industrial Trade in the Chicago area. Mr. Navigato was formerly associated with Buckbee Paper Co. of Chicago.

Dr. Moore Heads U. of Maine Dept. Of Industrial Cooperation

Dr. Terris Moore, former president of the University of Alaska, has been appointed director of the University of Maine's Department of Industrial Cooperation.

The University of Alaska, a landgrant institution like the University of Maine, was founded in 1917; and during the period of Dr. Moore's administration the physical plant was doubled and the total student enrollment in all parts of the university increased from under 400 to about 1500.

Dr. Moore will take up his duties on February 1.

Erspamer Joins H&W

Hollingsworth & Whitney Co. announces that Dr. August S. Erspamer has joined as assistant to the manager of Northern Mills. Dr. Erspamer will be stationed at the mill at Winslow, Maine. He has previously been assistant to the resident manager of St. Helens Pulp & Paper Co., St. Helens, Ore.

J.C. Hollingsworth

R.O. Brumley

R.A. Bowman

H.E. Werner

Crystal Relocates Sales Force

Jesse C. Hollingsworth, who joined Crystal last year, has been appointed Dallas District Sales Representative. His territory will consist of Texas, Oklahoma, Louisiana, Arkansas, Arizona, Mississippi, and New Mexico. His headquarters are still in Middletown, but he expects to move to Dallas within the next few months.

The Chicago district has been handled for the past year, by William H. White, and his district also includes Minnesota and Wisconsin.

Robert A. Popp has been in charge of the Southeastern district with headquarters in Atlanta Georgia since September of last year. His district includes the states of Alabama, Florida, Georgia, North Carolina, South Carolina and Tennessee.

Richard O. Brumley is Sales Representative of the St. Louis District. Robert A. Bowman is Middletown District Sales Representative and Homer E. Werner is Pittsburgh District Sales Representative.

Wilson Wyatt Enters Pulpwood Business

Wilson W. Wyatt, Louisville attorney and former federal housing administrator, has started an extensive timber-growing project in the area near the Bowater Southern Paper Corp. at Charleston, Tenn.

The nationally prominent attorney indicated that the potential pulpwood market presented by the new Bowaters mill, had attracted him:

"I have not made any contracts for timber," Mr. Waytt said. "It would be pointless to do so now, since a minimum of 12 years will elapse before the lumber is ready to market.

"But the existence of the Bowater's plant was a factor in my decision to grow timber in the Tennessee plateau region. The plant is big and substantial, with a major stake in the region, and I considered its commercial area a good place for a future market."

Mr. Wyatt has purchased 21,500 acres in Bledsoe, Van Buren and Sequatchie counties, and asked Carl I. Peterson, state-forester, for 500,000 pine seedlings for planting next fall and 55,000 yellow poplar seedlings for immediate planting.

Mr. Wyatt, who also owns 8000 acres of timberland in Fentress county, wrote Peterson that he already has planted 100,000 pine seedlings, which he received from TVA, in his new tri-county holdings.

Kimberly-Clark Transfers Dr. Day

Kimberly-Clark Corp. has announced the recent transfer of Dr. Winterton U. Day from its Neenah, Wis., mill where he was technical superintendent, to its Staff Research and Development laboratories. He will be working primarily on the converting processes and product development.

Dr. Day joined the research staff of Kimberly-Clark 12 years ago. He was transferred to Niagara Falls, N. Y. in 1944 as problem process engineer and later became technical superintendent of the corporation's creped wedding mill at Niagara Falls. He returned to Wisconsin in 1948 as technical superintendent of Neenah Mill.

Magruder Joins Oxford

Oxford Paper Co., New York has appointed Joseph H. Magruder to its Sales Organization. He will assume responsibilities in connection with the company's advertising, sales promotion and marketing programs.

(More People on Page 36)

The timber that took a taxi

Macon-Kraft, down deep in Georgia, cut a forest of pulpwood logs. They wanted to stack them fast, to feed their chippers all winter long. Jeffrey engineers installed a traveling pulp stacker with special chain conveyor "flights" to cradle each log. Soon more than *3 million* had taxied high. This travel-log typifies results of "The Team That Gets Things Done"

...that's JEFFREY!

***This** is Jeffrey, too!*

S-212 — SPUR ATTACHMENT

This rugged spur attachment for Jeffrey Special PW pulpwood chains is made of high carbon steel, formed hot in a hydraulic press. It is braced sidewise to slide smoothly and stand the pounding of heavy logs. It's one of the many parts Jeffrey manufactures each year — each built to rigid standards — to serve industry everywhere.

THE JEFFREY MANUFACTURING CO.

ESTABLISHED 1877

Columbus 16, Ohio

sales offices and distributors in principal cities

PLANTS IN CANADA, ENGLAND, SOUTH AFRICA

IF IT'S MINED, PROCESSED OR MOVED
...IT'S A JOB FOR JEFFREY!

Malcolm B. Pineo gives a brief yet comprehensive up-to-date survey of

Kraft Pulp Bleaching

The author, technical director of Brunswick Pulp & Paper Co., covers this field with a minimum of involved technical detail and sums up findings with regard to controversial points.

The bleaching of kraft pulp has been explored extensively by the pulp industry for many years. However, the published literature on the subject is conspicious by its absence although the numerous patents, either pending or granted, indicate, to some exten, the vast amount of work that has been done. As in all industries in which competition is acute, the manufacturers of bleached kraft pulp have zealously guarded the developments in techniques and methods by which they have won their position in the Industry. As higher and higher brightness levels are being obtained, however, it has required the cooperation of many other industries, particularly the chemical industry, and more knowledge is being diffused through greater participation.

Ferdinand Kraft (1) has aptly said, "For a better understanding of the purpose and effects of bleaching, it is first necessary to discuss color." The cellulose fiber itself will reflect the full visual range of normal light and thus is said to be white. Therefore, the phenomenon of bleaching of any chemical pulp is the removal of those materials chemically or physically attached to the cellulose which do not allow the complete reflection of normal light. To do this commercially, conditions need to be employed that will produce a high brightness pulp having reasonably high strength qualities at a cost which keeps the product in constant demand. These factors are usually the ones which determine whether or not the laboratory bleached samples are suitable for commercial operations.

The bleaching process involves two fundamental principles; first, dissolving and removal of the colored particles, and, second, the changing of the colored material into a substance capable of light reflectance. The former reaction is the one of most importance although the latter has an appreciable effect upon the final brightness. All known methods of bleaching have been developed to promote these changes with the maintainence of high strength and maximum yields.

Integrations and Cooking and Bleaching

The bleaching operation can not be established without first considering the extent to which the wood has been delignified through chemical pulping. After all, pure white pulp can be produced by careful delignification in the digestion process and likewise, pure cellulose can be isolated through bleaching alone. However, commercial operations must be a combination of the two if quality pulp is to be produced economically. It should be pointed out though that one is a function of the other and neither step can be successfully applied without a complete knowledge and control of each. Many mills have failed in the production of a high brightness kraft pulp, not because of a faulty bleaching operation but mainly because the wood has not been pulped properly. Thus, it is of little wonder that the experienced bleach plant operator will take a long hard look at his brown stock before he sets the conditions under which it will be bleached.

The specifications to which kraft pulps should be cooked in order to provide a bleachable grade of brown stock depend to some extent upon the properties desired in the final bleached pulp. If high strength is paramount then the cooking process is designed to preserve as much of the initial strength characteristics as possible but for many uses of bleached kraft pulp, strength is not the all-important factor and higher brightness and lower costs can be realized by cooking to lower permanganate numbers. It is usual for most grades of bleached kraft pulp to supply the bleach plant with brown stock having a permanganate number of not more than 18 and as low as 14 for some very soft grades.

For the purposes of this discussion, it will be assumed that a uniform flow of easy bleaching kraft brown stock, suitably pulped for normal paper making requirements, is available. The stock will have been well washed, screened, and its consistency adjusted approximately 4 per cent on a bone dry pulp basis. It will have a permanganate number of 16 to 18 and a cupri-ethylene diamine viscosity of more than 20 cp. as measured by the falling ball method. Strengh tests will indicate that, after bleaching, it will be acceptable for the purposes for which it is to be held.

Multistage Bleaching Essential

The bleaching of the above pulp to brightnesses exceeding 80 per cent has not been possible for more than 30 to 40 years. Even today, the processes in use by most mills are in need of further development if costs are to be lowered and quality improvements made. The bleaching of kraft pulps is much more difficult and appreciably more costly than the bleaching of sulphite or soda pulp but final levels of brightness of the kraft pulp can equal that of pulps cooked by either of the other two methods. The development of multistage bleaching has

A lecture delivered at the University of Maine, before the class in the Pulp and Paper Technology course.

been the answer to the bleaching of kraft pulps.

The need of multistage bleaching for kraft pulps is understandable when the variety of pulping residues are considered. Unlike the sulphite process, the kraft process does not solubilize iron compounds, and in addition the pulp contains lignin and carbohydrate residuals which have been polymerized by the action of the alkali during the cooking process. The less drastic action of the alkaline cooking liquors produces a pulp having much higher strength properties than those for pulps cooked by other methods, but also it produces a pulp containing more undesirable non-cellulosic compounds which have to be removed during the bleaching process if the pulp is to attain a high degree of brightness. It is mainly for this reason that multistage bleaching is absolutely necessary for pulps manufactured by the kraft process.

The choice of the number of stages depends upon the "softness" of the kraft brown stock although a system containing less than five stages would not meet the brightness demands of the final product and be expensive in chemical usage. A few drastic bleaching stages would also be detrimental to the strength characteristics of the bleached pulp. The choice of sequances has been well established although variations of the standard methods are found in most mills. Equipment limitations have necessitated many innovations, some of which have been surprisingly successful.

The bleaching process employs two principal reactions with a third side reaction of no less importance. The first of these is the dissolving and removal of the colored bodies by chemical addition or substitution whereby the insoluble residues are changed into a soluble stage. This reaction is exemplified by the chlorine-lignin combination which forms soluble chlorolignins. The second principal reaction is the changing of the colored particles to colorless ones by oxidation. This reaction takes place in the hypochlorite stages where oxygen is released to further the substitution and removal process. A supporting role is played by the alkaline extraction stages whereby the alkaline soluble materials are removed. Less emphasis is placed on this third phase of the bleaching procedure as an alkaline environment has been present in the cooking process and to a lesser degree in the alkaline hypochlorite stages. There are, however, many new compounds which have developed since the cooking process, in the chlorination and subsequent bleaching stages, which are now soluble in an alkaline medium.

"Even today, the processes in use by most mills are in need of further development if costs are to be lowered and quality improvements made."

Number of Stages Required

Modern kraft bleach plant practices encourage the use of at least five separate reaction stages each followed by thorough pulp washing. Many plants, due primarily to the demand for higher and higher brightnesses, feel that a sixth, seventh, and even an eighth stage is required. The additional stages also reflect the most economical use of bleaching chemicals, and the maintenance of maximum strength properties. However, the basic bleaching pattern has not been disturbed but rather supplemented in order to attain the desired levels of brightness.

The basic bleaching process for kraft pulps, common in most mills todays is:

(1) Acid Chlorination
(2) Caustic Extraction
(3) Oxidation with Hypochlorite
(4) Caustic Extraction
(5) Hypochlorite

A kraft pulp bleached by this process can be expected to attain a brightness of 80-82 per cent, strength values not less than 90 per cent of that of the original brown stock, yield lossess of from 4 to 6 per cent, and fiber lengths, as measured by fractionation and viscosity, of only slightly less than those of the unbleached pulps. For most grades of paper making pulp this system will produce excellent results with low bleaching chemical consumption and a minimum outlay of capital dollars for equipment. For higher brightnesses, however, this system is not adequate, if strength is to be preserved and chemical usage is to be minimized. Additional stages are required, as well as new chemicals which are more specific to the remaining lignin residues and which have little or no offect on cellulose. These super bleaching agents are discussed later.

Chlorination

Chlorination as the initial stage in kraft pulp bleaching is almost universally used. The reason for such complete agreement in a field so controversial as kraft pulp bleaching is that chlorine is much more specific in its reaction with lignin than hypochlorite or other oxidizing agents and its effect upon the cellulose material is practically nil. Also it is the cheapest chemical which is effective for lignin removal. It's reaction is fast, up to 90 per cent consumption during the first 15 minutes, and it serves to remove as much as 60 per cent of the chlorine consuming materials.

The chlorination stage consists of an acid proof tower, usually tile lined with acid resistant painting, capable of holding the stock in contact with the chlorine water for 60 to 90 minutes. The twoer is fed from the bottom by means of a pump through a chlorine mixer, and discharged out of the top into a pump

Technical Considerations of Color and Brightness

When discussing kraft bleaching it is necessary to define color and its component, brightness. Color, as we have already seen is the reflectance of normal light; white being its total reflectance, and black being its total absorption. Partial reflectance of all wave lengths of the visual spectrum would be seen as varying degrees of grey while the total absorption of some wave lengths and the total reflectance of others would be seen as one or a combination of many of the colors of the spectrum. Brightness on the other hand is the reflectance of a specific wave length or a small band of wave lengths having an average of 4580 angstrom units or 458 millimicrons. Therefore, it can be seen that the brightness of a piece of paper or of a pad of pulp may be somewhat different than its specific color and that two pulps having the same brightness may appear to be of different shades of color. Brightness evaluations, as interpreted in the pulp and paper industry, are measurements of the reflectance of a specific wave length of color, namely, 458 millimicrons. Not to confuse the issue further but to complete the brightness color picture, it must also be borne in mind that the visual efficiency of the human eye is not the same for all wave lengths and, therefore, will not truly reflect the brightness values.

"For higher brightnesses, however, five stages are not adequate if strength is to be preserved and chemical usage is to be minimized."

feeding a drop leg type pulp washer. Consistencies are held between 3.5 and 4.0 per cent stock and temperatures around 90°F are optimum. The pH mixture drops to 1.8 to 2.2 and a residual chlorine is usually maintained at the washer around 0.03 to 0.05 grams per liter.

Because additional retention time in the chlorination stage means larger capital expense for towers, the optimum retention time has been thoroughly explored, although 60 minutes is adequate. 90 minutes could be the break even point between capital cost and chemical savings. A second chlorination stage is favored by some mills but unless strength properties are of paramount importance, there is no need for this addition. When a second chlorination stage is used it is usually separated from the first stage by a caustic extraction.

A thorough wash is important following the acid chlorination stage. Unless the chlorinated lignins are as completely removed as possible at this point, these residues will be reprecipitated in the second stage caustic extraction and be very difficult to remove further along in the process. The chlorinated lignins are capable of consuming more available chlorine and thus increase the overall chlorine consumption if allowed to remain in the system. Also the medium is extremely acid and unless the pulp is separated from this medium, excess caustic is required for neutralization.

There is little or no change in the physical properties of the pulp as is passes through the first stage chlorination. It's chlorine demand has been reduced appreciably, up to 60 per cent of the original demand, but no upswing in brightness has taken place. Dirt contents have been reduced slightly and shive counts have remained unchanged. Yields have decreased as would be expected by the removal of an appreciable quantity of non-cellulosic material. The pulp has been conditioned, however, for more effective treatment by the succeeding bleaching stages.

Caustic Extraction

The second stage of kraft pulp bleaching is not as universially accepted as the chlorination stage. Most mills, however, follow the chlorination with a caustic extraction. Exceptions to this practice will be discussed a little later.

The chlorinated, washed pulp is now treated with caustic soda. It is usual to add 1.5 to 2.0 per cent on a bone dry pulp basis to the stock leaving the acid washer as it enters a chemical mixer. The temperature of the stock suspension is elevated to 150°F and as high as 190°F depending upon the experience of the particular mill. It is thought by some that the higher temperatures in the caustic stage are reflected in lower yields and poorer strength factors but these changes can be countered by lowering the amount of caustic added. A comprehensive study of steam costs versus chemical costs can usually establish the optimum conditions. Consistencies should be held as high as practical, usually 12 to 14 per cent, through this stage and major benefits from steam saving can be realized. Also, mass action, which plays some part in all these operations, is enhanced. All of the caustic used is not effective in solubilizing the alkaline soluble materials. Part of the caustic is neutralized by the residual acid from the chlorination stage. Chemical costs can be lowered by delivering to the extraction stage as completely washed free of these residual acids as possible.

The caustic extraction stage in kraft pulp bleaching lowers the chlorine demand from a half to about a fourth or fifth of the original brown stock depending upon the amount of caustic used and the conditions under which the extraction takes place. Brightness values of the pulp are increased slightly but the increase is negligible compared to the drop in chlorine consuming materials. Strength factors have been altered reflecting a rapid rise in tear and a dropping off in Mullen. The removal of some hemi-cellulosic material with a resulting increase in alpha cellulose would disturb the refining characteristics of the pulp by making it more resistant to beating. The effect is one of slower hydration and thus a less impaired fiber at any given freeness.

Hypochlorite Stage

The third step in normal kraft pulp bleaching is its treatment with hypochlorite. The pulp has been subjected previously to chemical treatments designed to remove all acid and alkaline soluble particles under controlled conditions in which the cellulose for all practical purposes has remained unaltered. Its treatment with hypochlorite is designed to further purify the cellulose by oxidation. The pulp is still dark in color, due principally to the presence of unremoved chlorinated lignins and other colored substances. These substances are readily attacked by oxidizing agents, of which calcium or sodium hypochlorite are the most commonly used. Their use stems from economics, ease of preparation, and ease of control. The choice between calcium and sodium hypochlorite is vigorously debated, with sound arguments on both sides. It is not unusual to find two mills in the same geographical section of the country using different bases for hypochlorite. Calcium base hypo is thought to be cheaper by some mills while others feel that the cost advantage is offset by higher capital cost for equipment and the added caustic needed for buffering. Calcium base hypo tends to be less stable than sodium base and carry-over lime is always troublesome to the bleaching action and washer efficiency. Either will effect the same purification action if prepared ideally and used under comparable conditions.

The first stage of hypochlorite treatment is continuous. The stock leaves the caustic washer at 12-14 per cent and is mixed at this consistency with the hypochlorite solution by means of a stock and chemical mixer. The hypochlorite is buffered with caustic soda to an extent that the final pH of the stock suspension at the end of the retention period is not greater than 9.0 or less than 8.5. The temperature of the suspension is adjusted to match the reaction rate to the retention time for the desired brightness. Temperatures exceeding 105°F promote a reaction rate harmful to the cellulose fiber unless the bleaching solution is too well buffered.

The practical application of hypochlorite solution on semi-bleached kraft pulp depends upon, (1) the amount of hypo used (2) the temperature of the pulp suspension (3) the amount of caustic soda used for buffering, and (4) the time of reaction. Enough hypo should be added to maintain a trace residual at the end of the reaction period. The temperature of the stock suspension should be adjusted to bleach the stock to the desired brightness. The reaction should be buffered to permit a reaction rate sufficient to raise the brightness the desired amount under the con-

"It is thought by some that the higher temperatures in the caustic stage are reflected in lower yields and poorer strength factors but these changes can be countered by lowering the amount of caustic added."

ditions of time and temperature chosen. The time of reaction should be as long as the size of the equipment and the rate of production will permit.

Typical operating conditions for a first stage hypochlorite kraft bleach on Southern pine pulp which has been chlorinated and extracted with caustic soda are as follows:

(1) Stock consistency—12% B. D.
(2) Retention period—2 hours
(3) Hypochlorite added (NaOCl) 1.2% as available chlorine.
(4) Temperature—100°F
(5) Final pH—8.8
(6) Residual chlorine—Trace
(7) Caustic buffer—0.25%

The chlorine demand of the stock to the first hypo stage is approximately 1.4 per cent and 0.7 per cent leaving it. The stock is again thoroughly washed leaving this stage.

The physical properties of the pulp have been altered appreciably during the hypochlorite treatment. The brightness has been increased 30 to 40 points; from 35 to 75. Dirt counts have been halved and shives have been reduced tenfold. Both Mullen and tear have dropped from 6 to 8 percent and the viscosity has been lowered from 22 cp to 15 cp. The pulp is brighter, cleaner, and weaker than it was entering the stage. Yield losses have been nominal possibly in the range of 1 percent.

Second Caustic Stage

During the washing operation following the first hypo stage, much of the dissolved material has been removed. However, a substantial amount of this material remains in the pulp and must be removed before further treatment with hypochlorite is practical. Therefore, a second caustic extraction stage is introduced. The washed pulp is maintained at high consistency, 12 percent, and treated with 0.5 to 1.0 percent caustic soda for one hour at a temperature of 180 to 190°F. This second extraction with caustic removes most of the oxidized material still remaining as well as some of the hemi-cellulose broken down during the first hypo treatment. This action is reflected by a slight increase in tear and a slight drop in Mullen. The chlorine demand of the pulp has been reduced to approximately 0.5 percent and the viscosity to 12-13 cp. The average fiber length shows a slight trend upwards. Brightness has dropped a few points due to the alkalinity of the washed stock. There appears to be an organic indicator present in kraft stocks which causes the measured and visual brightness to drop when the pH is adjusted to the alkaline side of the range.

Second Hypochlorite Stage

The second hypochlorite stage is similar in all respects to the first hypo stage.

"There is some difference of opinion whether a low or high density stage is most effective at this point but no real evidence supports either and the high density stage requires less reaction vessels as well as less steam for temperature adjustments."

There is some difference of opinion whether a low or high density stage is most effective at this point but no real evidence supports either and the high density stage requires less reaction vessels as well as less steam for temperature adjustments. Two hours retention time is normal for the second hypochlorite stage. Consistencies of 12-14 percent are common, and temperatures up to but not to exceed 105°F are used. Sufficient hypochlorite is added to maintain a trace of residual chlorine and the final pH is usually held between 8.5 and 9.0. The pulp is thoroughly washed after which any residual chlorine is killed with sulphur dioxide and the pH adjusted to 5.5 to 6.0 for brightness stability.

The final pulp will have a brightness between 80 and 82, and strength factors 10 to 20 percent lower than the original brown stock. A cupri-ethylene diamine viscosity of 10-11 cp and dirt and shives counts of 1-2 ppm. It's alpha cellulose content will fall between 85 and 88 percent. This pulp can be classified as a paper making kraft pulp having strength values exceeding those for bleached sulphite pulp and a brightless level acceptable for most grades of paper.

The above discussed five stage system for bleaching southern pine kraft pulp can best be summarized by presenting a typical mill system study showing the conditions by which the pulp was bleached and the results:

Brown stock $KMnO_4$ No.		16.85
Brown stock Cl_2 No.		8.65
I. Chlorination Stage, % Cl_2		4.6
	Time	50 minutes
	Temp.	65°F.
	Cons.	3.5%
	Residual	Trace
	$KMnO_4$ No.	11.9
	Cl_2 No.	5.75
II. Caustic Ex. Stage, % NaOH		2.4
	Time	60 minutes
	Temp.	160°F.
	Cons.	10%
	$KMnO_4$ No.	2.75
	Cl_2 No.	1.2
III. Hypochlorite Stage, % Cl_2		1.2
	Time	3 hours
	Temp.	105°F.
	Cons.	10%
	pH	8.8
	Residual	Trace
	$KMnO_4$ No.	1.85
	Cl_2 No.	0.75
IV. Caustic Ex. Stage, % NaOH		1.2
	Time	60 minutes
	Temp.	160°F.
	Cons.	10%
	$KMnO_4$ No.	1.45
	Cl_2 No.	0.60
V. Hypochlorite Stage, % Cl_2		0.25
	Time	2 hours
	Temp.	105°F.
	Cons.	10%
	pH	9.5
	Residual	Trace
VI. SO_2 Acidulation, pH		6.5

PHYSICAL PROPERTIES Stage	B.S.	I	II	III	IV	V
Brightness, Germ	23.4	20.0	36.5	67.5	65.2	79.9
Dirt, ppm	18.0	20.0	19.4	4.4	5.5	3.5
Shives, ppm	48	21	15	4	0	0
Mullen @ 550F.	140	146	135	139	137	132
@ 300F.	162	170	151	159	149	151
Elmendorf @ 550F.	268	254	283	235	240	218
@ 300F.	205	210	225	210	194	187
% Fractionation, 4RPG's	53.2	53.4	48.6	47.8	47.0	45.0
Viscosity, cp	27.0	21.7	15.9	14.7	12.7	11.4

Operating Costs!!

No discussion of bleach plant operation can be complete without talking about cost. The above five stages represent the minimum standards of brightness at a minimum cost. The sequence shown used 93 lbs. of chlorine as chlorine, 36 lbs. of chlorine as hypochlorite, 60 lbs. of caustic as caustic, and in the case of sodium hypochlorite, 43 lbs. of caustic as hypochlorite per ton of bleached pulp. Sulfur dioxide usage would approximate 16 lbs. per ton and caustic for buffering about 20 lbs. per ton. Therefore, a total chemical consumption and cost of bleaching chemicals would be roughly:

Chlorine 129 lb. @ 3.75c/lb. =	$4.84
Caustic 123 lb. @ 3.75c/lb. =	$4.61
SO_2 16 lb. @ 1.50c/lb. =	.24
Total	$9.69

The second sequence shows the following balance:

Chlorine 121 lb. @ 3.75c/lb. =	$4.54
Caustic 127 lb @ 3.75c/lb. =	$4.76
SO_2 10 lb @ 1.50c/lb. =	.15
Total	$9.45

It can be seen, therefore, that the chemical cost for bleaching easy bleaching southern kraft pine pulp to an 80 percent brightness level with chlorine, caustic, and hypochlorite is roughly $10.00 per ton of bleached pulp. This cost is substantially higher than that for sulphite pulp even at brightnesses in the 85 to 88 percent range. The bleached kraft industry has to provide economics in the other phases of operation in order to compete with the sulphite market. Chemical recovery, higher yields, cheaper wood, etc., more than make up for the differences in the bleaching costs.

Before proceeding to a discussion of methods for producing bleached kraft at brightnesses in excess of 80 percent, it might be well to review the normal five stage system to see if changes can be made to either reduce cost or improve quality. The chlorination stage is standard for the first stage in the bleaching system. Chlorine as a bleaching agent is the cheapest and most effective chemical to be found for removing the bulk of the undesirable colored materials. Its action is selective to lignin and its behavior towards cellulose is very passive. Optimum conditions of operation are easy to establish and control and capital requirements for equipment are quite nominal. It might appear that maintenance costs would be high due to the need for acid proof towers and washers but this feature of the chlorination phase has been reduced to a minimum. Retention times and washer efficiencies are low and high respectively unlike the hypochlorite and caustic extraction stages. It should be borne in mind, however, that ideal operating conditions of uniform consistencies at high levels, perfect mixing, optimum temperatures, low excess chlorine, and good washing all affect the overall efficiency of the stage. One can not be complacent concerning the chlorination stage, even though the bleaching chemical is cheap and effective, as the misuse of this chemical can be costly and harmful to the final pulp quality.

Second Chlorination Stage

The use of alkaline extraction as a second stage is not universally accepted. The installation costs are relatively high as the vessels must withstand high temperatures and the chemical requirements are high due to the amount needed for neutralizing the residual HCl in the washed pulp following chlorination. Also, the pulp leaving the chlorination stage still reacts to chlorine and further chlorination is beneficial. A substitute for the first caustic extraction stage has been found in secondary chlorination followed by milk of lime neutralization. The process calls for over chlorination and the formation of calcium hypochlorite between the excess chlorine and the milk of lime solution. The stage is operated at low density and the final pH controlled at 8.5 to 9.0. The flash hypochlorite is very effective in reducing the chlorine demand of the pulp and strength losses are negligible if the system is operated correctly. A typical chemical balance is as follows:

Second Chlorination Lime Neutralization	
% Cl_2	2.6
Time	3 minutes
% $Ca(OH)_2$	4.2
Time	30 minutes
Consistency	3.5%
Temp.	85°F.
pH	8.9
Residual	Trace
$KMnO_4$	3.6
Cl_2 No.	1.6

Pulp Properties	*In*	*Out*
Brightness, Germ	17.5%	43.3%
Viscosity, cp	23.1	22.5
Dirt, ppm	4.5	3.3
Shives, ppm	246	159
Mullen @ 550F.	135	141
@ 300F.	148	159
Elmendorf @ 550F.	272	254
@ 300F.	239	230
% Fractionation, 4 RPG's	63.8	63.2
Chlorine No.	5.3	1.6

The advantages of the double chlorination-lime neutralization stage are threefold:

(1) A substantial savings in capital investment, (2) an overall savings in bleaching cost, even though the chemical costs are higher as there is an offsetting cost in steam savings, and (3) brightness values are higher.

The third and fourth bleach stages, high density hypochlorite and caustic extraction respectively, are standard for the industry and no comments are offered other than those already given.

Considerations on the Final Hypochlorite Stage

The final stage hypochlorite has been studied at great length by almost all manufacturers of bleached kraft pulp. The various investigations have led to a variety of applications, none of which have found general acceptance. Many mills believe that a final low density stage is most desirable while others claim that high density is preferable. It is said that the low density stage offers advantages in controlling the rate of bleaching to protect the pulp from over bleaching and subsequent strength losses. However, a thorough study of the relative merits of high density and low density last stage hypochlorite bleaches indicated the following:

(1) Neither the high density bleaching process nor the low density bleaching process could show any consistent brightness advantages over the other.

(2) Neither the high density nor low density bleaching process appeared to

"It is best to engineer the water system so that recirculation is minimized and plenty of fresh water is available."

cause any appreciable strength degradation, and no significant trend to higher strength retention could be detected for either process.

(3) Neither the high density nor low density bleaching process required more or less available chlorine to reach the same degree of purification or brightness.

As there appears to be no advantage to low density final hypochlorite bleaching as compared to high density final hypochlorite bleaching in regard to strength levels, brightness attainments, and chlorine usage, it is suggested that high density final hypochlorite bleaching is preferable from a cost standpoint. With high density bleaching, steam usage is much lower and equipment requirements appreciably less for the same retention period.

It would be very difficult to justify a batch high density final hypochlorite stage as compared to a continuous stage. The horsepower required are many times that of the continuous system and bleacher costs exceed the capital outlay for continuous towers. However, from a quality control viewpoint, the small, (usually six ton), capacity of the individual batch bleachers offer some advantages. Even though every effort is made to prevent them, interruptions in the bleaching process are common and must be handled carefully to prevent brightness reversion and strength losses. With a battery of bleaching cells, it is much easier to vary the conditions under which the final bleaching is carried out and stabilize both brightness and strength. It is necessary for each mill to weigh these advantages against the higher initial cost and greater power usage.

Soaking Chests

One phase of the bleaching system which has had considerable study is the use of soaking chests. These chests are used to allow time for the diffusion of dissolved material from the interior of the fiber before the final work. It is suggested that the chemical reactions are not confined to the outer surfaces of the fiber alone and that rapid dilution and subsequent washing does not remove all of the solubilized substances. Even the complete displacement of the fluid medium surrounding the fiber, through fresh water application as the stock passes over the washer, is thought to be inadequate. However, no experimental data support this theory and soaking stages are not in common use.

Pulp Washing

No paper on kraft pulp bleaching, or any bleaching system for that matter, could be considered complete without a thorough discussion of pulp washing.

"As there appears to be no advantage to low density final hypochlorite bleaching as compared to high density final hypochlorite bleaching in regard to strength levels, brightness attainments and chlorine usage, it is suggested that high density final hypochlorite bleaching is preferable from a cost standpoint."

High washing efficiency is often the key to successful bleach plant operation as the failure to remove all solubilized material from the pulp after each reaction stage could well mean high chemical costs and poor quality. Modern washing equipment is designed to do just that and the success with which it is accomplished is remarkable. Often, however, a mill grows away from its water supply and bleaching operations suffer. A round figure frequently used for determining the amount of fresh water required for kraft bleaching is 10,000 gallons per daily ton per bleaching stage. In other words, a mill producing 500 daily tons of bleached kraft by means of a five stage bleaching system must expect to use not less than 25,000,000 gallons for bleaching alone. To be sure, some of the effluents from the washers can be reused, and most of them are except from the initial chlorination stage, the first caustic extraction stage, and the first hypochlorite stage from which the complete effluent must be sewered. Some economics in water usage are practiced by recirculating the filtrate from the acid chlorination stage back to the washer for vat dilution. Also, if push comes to shove, filtrates from all washers can be recirculated but side reactions, poor washing, and brightness reversion is often the result. It is best to engineer the water system so that recirculation is minimized and plenty of fresh water is available.

The practice employed in most mills is to counter-current the water and the stock. For instance, a five stage bleaching system identified as 1, C-2, CE-3, H-4, CE-5, H, would reuse the filtrate from 5 to 3 sewer, 4 to 2 sewer, and 1 to sewer. Fresh water would be used on all showers and filtrate recirculation would be installed in the chlorination stage. Fresh water would also be used for vat dilution at #5 washer as well as for discharge dilution if a low density system follows the final washer. In most cases the fresh water would be extended by returning all excess white water from the pulp drying machines although this white water would probably be confined to the final stage washer. The fourth stage caustic extraction washer must also be supplied with fresh water for vat dilution although some recirculation is permissable. If too much recirculation is used for vat dilution in the washer following the second caustic extraction stage, the pH of the washed stock is too high to permit normal oxidation in the final hypochlorite stage. This observation is also true for the first caustic extraction stage if recirculation is used.

Obtaining Very High Brightness

A well operated, five stage kraft bleach plant having adequate retention times in each of its stages is capable of producing bleached kraft pulp at 80-82 percent brightness while retaining most of the strength characteristics of the unbleached stock. But what about pulps at brightnesses of 85 or 88 percent? For the production of bleached pulps at the higher brightnesses, excepting dissolving pulps where strength factors are of little concern, "super bleaching agents" must be used. These agents must be selective in their action in that they must remove or oxidize the residual colored materials without attacking the cellulose fiber itself. Only two such agents have found acceptance in the commercial bleaching of kraft pulp, they are, chlorine dioxide and sodium or hydrogen peroxide. Technologists advance the theory that the success of chlorine dioxide and the peroxide lies in the fact that each have a lower oxidation potential than hypochlorite. It is thought that cellulose remains undegraded if bleached with an oxidizing agent having an oxidation potential of less than 0.9 volts whereas the non-cellulosic impurities are oxidized at the lower potentials. Except at the higher pH's, 10-11, hypochlorite has an oxidation potential of 1.0 volt or higher while on the same pH ranges chlorine dioxide may be as low as 0.6 and the peroxides as low as 0.3 volts. The main drawback to the use of the "super bleaching agents" is their cost.

Chlorine Dioxide

Chlorine dioxide as a super bleach, supplementing the conventional system with a sixth stage, has been used quite widely in the Scandinavian countries to produce bleached kraft pulp at brightnesses of 88 to 90 percent. The process is receiving favorable notice in this

country and Canada with three installations already in production. The rest of the industry is currently evaluating the economics involved and several chemical companies are offering patent rights and engineering know-how. The manufacture of chlorine dioxide, unlike chlorine, must be done at the pulp mill site as the gas itself cannot be lignified without exploding.

Chlorine dioxide can be produced by several methods, most of which start with sodium chlorate. The sodium chlorate can be reacted with sulphuric acid to form sodium acid sulphate and chloric acid. The chloric acid in turn is reduced with methyl alcohol to form chlorine dioxide, carbon dioxide and water. The chlorine dioxide is generated from sodium chlorate by this method at an efficiency of 85 percent based on the material balance. The sodium acid sulphate along with the excess sulphuric acid is neutralized with soda ash and returned to the chemical recovery plant as salt cake make-up for the manufacture of the cooking liquor.

Chlorine dioxide can also be generated from sodium chlorite with chlorine gas, sulphur dioxide gas, and hypochlorite bleach liquor. The chemistry of chlorine dioxide manufacture and the mechanism by which it bleaches pulp is not clearly understood and awaits more fundamental research work. However, it has been proven practically that chlorine dioxide on the acid side will bleach kraft paper to 90 percent brightness without losses in pulp strength or viscosities. It is reported that the cost is relatively high in that the chlorine demand is in the neighborhood of 10 to 20 lbs. per ton of bleached pulp at an overall depreciation and generating cost of 25 to 30c per pound.

Peroxides

Sodium or hydrogen peroxide is also used as a super bleaching agent. Its effect on pulp is similar to that of chlorine dioxide, in that the pulp is bleached to the higher brightnesses without strength or viscosity losses. The use of the peroxides for chemical pulp bleaching is currently being explored although it has been used for groundwood bleaching for some few years. Sodium peroxide is delivered to the mill at a price of 18 to 20c per pound and requires little or no capital investment for the application. The peroxides will increase the brightness from 82 to 88 percent using 0.43 percent H_2O_2, equivalent to 1.0 percent Na_2O_2, under controlled conditions either as a final stage bleach or in an intermediate stage. Much is yet to be learned concerning the use of super-bleaching agents for high brightness kraft pulp. The encouraging point is that much effort is being spent to develop these agents and undoubtedly they will come into their own in the very near future. There are even some indications that the super-bleaches can be applied in the intermediate stages for the production of normal brightness pulps at a cost lower than normal bleaching procedures. This replacement of standard bleaching agents with the super bleaches may be practical because of the stronger oxidizing power of the super bleaches and their selectivity for non-cellulosic impurities. After all, the initial cost of the bleaching chemical is not the important factor. The important factor is the relationship between its selective oxidizing power in terms of brightness increase and the amount of the chemicals required.

In summarizing the preceeding discussion, it is pointed out that the material presented is quite general in nature and should not be construed as specific. Kraft pulp bleaching has come a long way in the fifteen years just past but its development within the near future should over-shadow any progress to date. There is an urgent need for additional fundamental research work on chemical pulp bleaching to establish scientifically the mechanisms involved in the bleaching processes. The manufacturers of bleached pulps have made enormous strides in stabilizing their processes. These gains are best seen in the varieties and high qualities of the expanding paper markets.

MEAD CHESTNUT CORES

protect shipments better because they are tougher

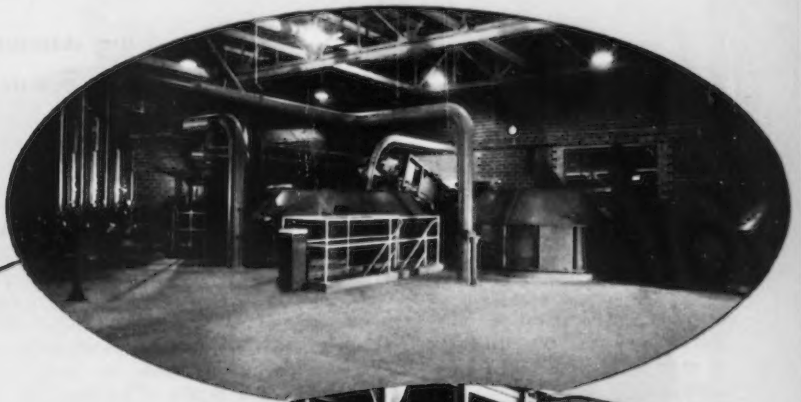
If you want your shipments to arrive at their destinations in the same condition in which you sent them, use MEAD Chestnut Cores. They have exceptional stiffness and crush resistance. Spirally constructed of chestnut and other hardwood fibers, they assure full protection for your product all the way from you to user.

MEAD Chestnut Cores are available in any desired length, diameter or wall thickness, and to your own crush specifications. Write for free samples made to your requirements. No obligation, of course.

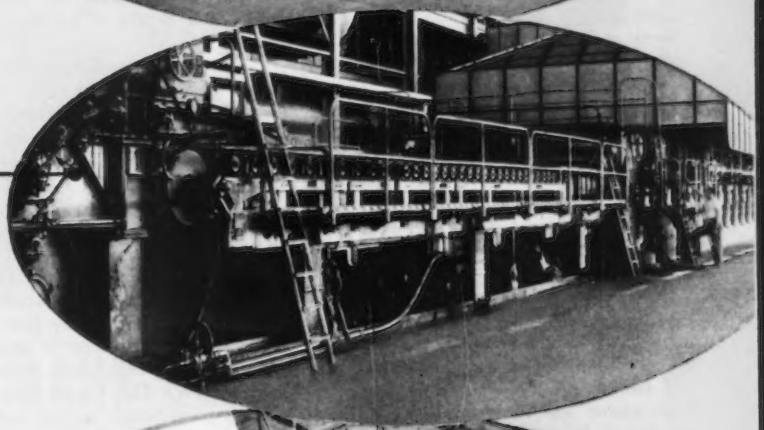
Mead Board Sales, Inc., Lynchburg, Va.
Boston • Chicago • Cincinnati • Detroit • Newark

From pulp to paper products

RELY ON A SINGLE SOURCE

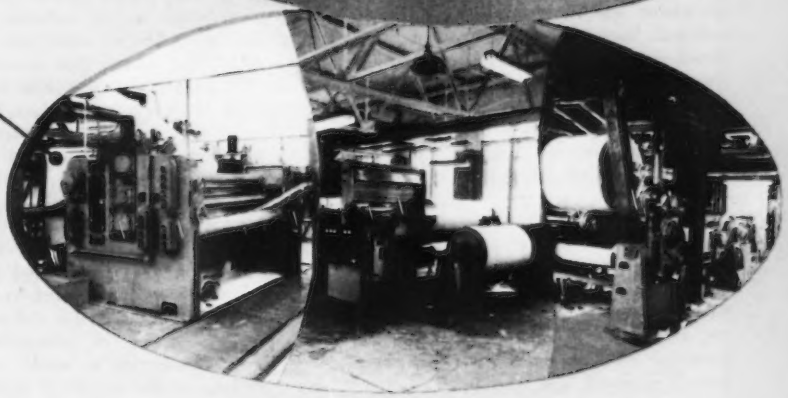


stock preparation



paper machine

converting



Black-Clawson, with its Shartle and Dilts Divisions, is the one source where practically every item found on a mill or converter's equipment list can be purchased.

When you concentrate your new equipment orders at Black-Clawson you place full responsibility for performance with one supplier. You buy engineering that starts with mill study and stands on the rock of long experience. It's only logical to hitch your program to the leader.

THE BLACK-CLAWSON COMPANY

HAMILTON, OHIO • MIDDLETOWN, OHIO • FULTON, NEW YORK

APPA Opposes U. S. Financing of Foreign Mills

The following statement outlines APPA's viewpoint as presented to the Senate Banking Committee

The existence of several agencies established by our Government through the Congress and also in cooperation with other nations, the common purposes of which have been to make available financial and technical assistance to foreign nations, makes it highly desirable to examine closely these agencies in the light of the objectives for which they were initially established in order to determine if the facts of the current world situation warrant their continuation as presently constituted, and to measure the results of past operations with a view to deciding if they have in each instance been consonant with the best interests of the United States.

The United States by its membership in the United Nations has given financial assistance and cooperation to the Food and Agriculture Organization; it has joined with others in efforts to stabilize world currencies by participating in the International Monetary Fund; and it has been a major factor in the organization and financing of the International Bank for Reconstruction and Development. Our country has further drawn on its resources in behalf of others through the Foreign Operations Administration and its predecessors, the Technical Assistance Program, and by extension and expansion of the Export-Import Bank.

Of major concern is the fact that in making judgment as to the desirability and propriety of loans, these agencies have been chiefly concerned with the value of a loan to the borrowing country and insufficiently interested in the potential effect of such loans upon the overall economy and specific industries of the United States. Further, so far as is known, it is not now required of any of these agencies that full advance publicity be given to their operations in order that all interested parties may be given an opportunity to voice their opinions before final approval is given to either a proposed loan or other type of agency action.

In recent annual reports of the International Bank of Reconstruction and Development there have appeared statements which raise serious questions concerning this objective and the means available for its attainment. These statements also suggest the necessity of changes in operating procedure to assure actions that will consistently redound to the welfare of our country. Some of the statements made in these reports have been to the effect that the Bank may:

1. Encourage production abroad which could be usefully and economically imported into the United States.

2. Aid foreign agencies in the United States to stimulate sales of foreign products.

3. Work to remove barriers to large imports contributed by poor distribution facilities for imported specialties.

While these may superficially be beyond reproach, it is significant that the Bank is not required by law to follow a procedure calculated to prevent substantial injury being done to our domestic industry. The Export-Import Bank, therefore, although having authority to take actions, the effect of which may be imports of such a volume that domestic producers of products similar to or competitive with the imported product may suffer the loss of a substantial part of their home market, operates without any of the restrictions and protective devices which are now a part of the Trade Agreements Act as amended. Further, action by the Export-Import Bank may affect changes in the supply and distribution of raw materials needed by the industries of the United States and may increase the amount of competition faced by our industries in world markets. Examples of the results of actions taken without consultation with the domestic paper industry by agencies are to be found in the increased volume of United States imports of paper from Finland and Austria as stated herein.

Under what is now the Foreign Operations Administration, money was made available not only through procurement authorizations, but also for the construction, rehabilitation or modernization of all types of manufacturing facilities in "Marshall Plan" countries. Dealing specifically with the pulp and paper industry abroad, from our available records it would appear that Austria was the prime beneficiary. In 1951 Austria was granted outright $15,194,000 for modernization of seven of its largest paper mills.

All in all, since 1950, $15,194,000 in direct dollar aid has been made available to Austria's pulp and paper industry for new machines, modernization, etc. The ECA has stated these funds have permitted Austria to double its paper and board making capacity, thereby increasing her exports substantially in order to earn foreign exchange.

In the early part of 1950, the ECA assisted in partial financing of the construction of a kraft pulp and paper mill in Cacia, Portugal. This amounted to $6,240,000 of the $9,580,000 needed to construct the mill.

Concluding this brief report on the Foreign Operations Administration, it should be pointed out that procurement authorizations for pulp, paper, paperboard and paper products from April 1948 to the present, approximate $130 million.

Both Chile and Finland have applied for and received substantial loans from the International Bank for Reconstruction and Development, for the development and/or improvement of their pulp and paper industries. In May 1952, Finland was granted a $20,000,000 loan, $9,500,000 of which was allocated by the Bank of Finland to the woods products industries and $1 million was allocated to land clearance and building for forest roads. In September of this year, Chile was granted a $20 million loan for the construction of a chemical pulp mill and a newsprint mill.

No information is available in this office as to specific loans by the Export-Import Bank to construct, rehabilitate or modernize pulp and paper mills in foreign countries except the pending $18 million to $20 million loan to New Zealand to finance part of the cost of an $85 million lumber, pulp and paper mill project. The U. S. loan would be used to finance necessary equipment.

8 WAYS TO MAKE BETTER PAPER

Rohm & Haas resins and chemicals are aiding the paper industry every day in a great many ways. Rohm & Haas offers a wide range of products, plus valuable technical service, to assure reliable performance at every step. Check your needs on the coupon to obtain further details. No obligation, of course.

WET STRENGTH—*Uformite* resins

PAPER COATING—*Rhoplex* acrylic emulsions

PITCH CONTROL—*Tamol N* dispersant

PULP BLEACHING—Sodium and zinc hydrosulfite

DE-INKING, WETTING AND DISPERSING — *Triton* surface active agents

SANITIZING AND DEODORIZING—*Hyamine* quaternary ammonium chlorides

STARCH CONVERSION—*Rhozyme* diastatic enzymes

TAMOL N, TRITON, HYAMINE, RHOZYME, RHOPLEX, *and* UFORMITE *are trademarks, Reg. U.S. Pat. Off. and in principal foreign countries.*

ROHM & HAAS COMPANY, Resinous Products Division
Washington Square, Philadelphia 5, Pa.

Gentlemen: Please send me, without obligation, performance and technical data on the following:

☐ TAMOL N ☐ TRITON ☐ HYDROSULFITES
☐ HYAMINE ☐ RHOZYME ☐ RHOPLEX
☐ UFORMITE

Name_____

Firm Name_____

Address_____

City_____ State_____

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

THE RESINOUS PRODUCTS DIVISION

Washington Square, Philadelphia 5, Pa.

Representatives in principal foreign countries

In addition to the foregoing action by the United States and international banking and assistance organizations, the Food and Agriculture Organization of the United Nations has acted outside the field of technical matters and has undertaken programs which constitute potential threats to the United States paper industry.

Last year, for example, the Forestry Division of the Food and Agriculture Organization of the United Nations held several meetings in different parts of the world to discuss the possibilities for increasing the world's pulp and paper production through modernization of present facilities, and through the utilization of tropical woods or woods indigenous to the respective areas, and other fibrous materials.

Also, in December of last year, a general meeting was held in Rome, Italy, to discuss substitute raw materials to produce enough paper pulp to meet the rising world demand for paper and newsprint. The possibilities of making paper pulp from tropical and subtropical woods and agricultural discards were studied. G. E. Chidester, Chief, Division of Pulp and Paper, Forest Products Laboratory, Madison, Wisconsin, was chairman of the meetings.

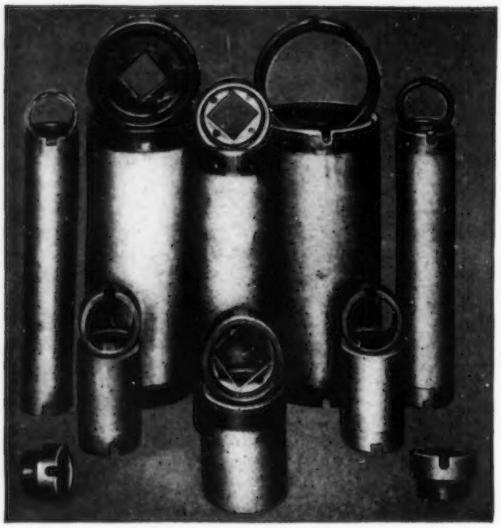
We, of course, are not in a position to know precisely the amount of American money that has been used abroad to rehabilitate pulp and paper mills or to erect new plants in that field. We are led to believe, however, that the amount is considerable. The pulp and paper industry already feels the competition so engendered, and realizes that distortions in the United States pulp and paper market are being created for various papers. The full effect of this will be apparent in less prosperous times, in the loss of earnings by domestic paper and pulp companies, including their employees.

It is our understanding that about $40 million in American funds has been allocated to Finland since the end of World War II for the improvement of its wood using industries, principally pulp and paper. It is our feeling that this is a clear-cut case where American money has been used to build up foreign competition for a domestic industry, since Finland has been and now is actually dumping paper into the American market. In the first nine months of 1953, imports of a single grade (kraft test liner) totaled 26,000 tons. This paper entered the United States at a declared value of approximately $104 per ton, a duty of 10 per cent being paid on this value, certified as the normal price in the country of origin (Finland). This kraft test liner, however, was actually sold duty and ocean freight paid, for $107.50 a ton, f.o.b. New York. At the same time, Finnish kraft pulp was being sold, delivered in the United States, at from $100.00 to $135.00 per ton. This type of transaction is a clear case of dumping.

It is also a clear case of American dollars being used to build up foreign competition to the point where to get rid of overproduction they must dump the excess back on our shores, thus lowering our markets with the net result that the United States pays twice; once to build up competition, and once in meeting cut-rate prices.

We also understand that several million dollars of American money is being poured into Chile and Brazil for the construction of pulp and paper mills, ostensibly to fill domestic orders. This, of course, will disrupt a sizable export business from the United States and no doubt later on will result in actual imports from these countries to the United States, where present capacity is equal to all demand.

The foregoing statement indicates partly the extent to which the financial and related organizations sponsored by and participated in by the United States have affected the United States paper industry and those having a large interest in that industry by reason of investment and employment.



ELIXMAN
CORES
CAPS

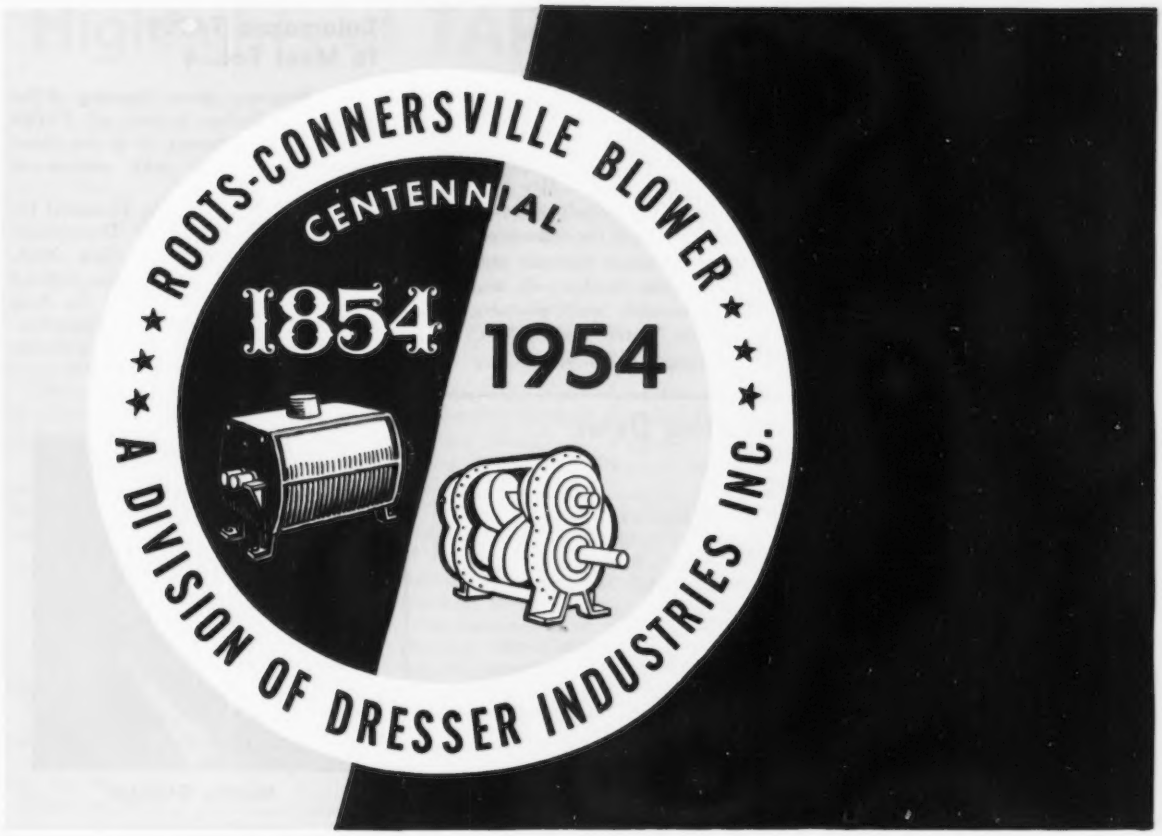
Straight wound paper cores made in sizes from 2" to 10" inside diameter with any thickness wall required.

Long draw protected slot caps of heavy gauge steel in all standard sizes.

Heavy duty caps with reenforced square hole. This patented feature of reenforcement gives added strength and durability.

Samples of caps or cores will be gladly submitted

ELIXMAN PAPER CORE COMPANY, INC.
CORINTH, N. Y.



Air-handling specialists for 100 years

Starting in 1854 with the invention of the Rotary Positive Blower by our founder, Francis M. Roots, our company's services to industry were, for many years, devoted exclusively to air-handling problems.

As industry developed new applications of gases for fuels and chemicals, it was a natural step for us to move into this field because the general principles of moving and measuring air and gas are so closely similar.

Thus, Roots-Connersville service has been widened to include seven basic types of equipment for handling gas or air. The most recent development has been the new Spiraxial Compressor, first marketed in 1953.

So, for a century we have been engaged exclusively as specialists in handling gas and air. That is our only business. We like to think that this is one of the important reasons why Roots-Connersville equipment has been so widely accepted and has proved so satisfactory in every industry where processing involves the movement of air or gas.

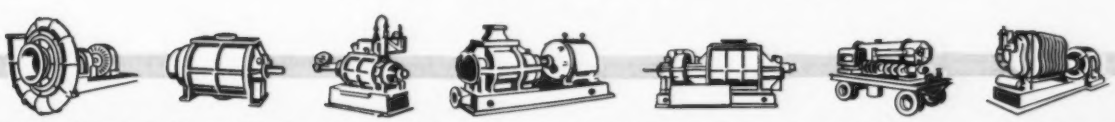
The growth which we have experienced over 100 years could not have been possible without the loyal support of our many thousands of customers. We thank them for this evidence of good will—and we offer the same high type of equipment and service to any industry that has a problem of moving gas or air.

ROOTS-CONNERSVILLE BLOWER

Reg. U.S. Pat. Off.

BLOWER BUILDERS R.C. SINCE 1854

A DIVISION OF DRESSER INDUSTRIES, INC.
154 River Ave. • Connersville, Indiana



Centrifugal and Rotary Positive Blowers and Exhausters • Positive Displacement Meters • Vacuum Pumps • Gas Pumps • Inert Gas Generators • Spiraxial Compressors

NEWS OF ASSOCIATIONS

Southeastern Supts. Give Scholarship to N. C. State College

The Southeastern Division of The American Pulp and Paper Mill Superintendents Assn. recently established a $200 annual undergraduate scholarship in the School of Forestry, North Carolina State College, Raleigh, N. C. Announcement of the creation of the award and the first presentation of the award was made by Vinson K. Shannon, Mead Corp., Sylva, N. C. Mr. Shannon is chairman of the Southeastern Division.

The occasion of the announcement and presentation was a luncheon attended by leaders of the South's pulp and paper, as well as other wood products, industries. John Tester, Lenoir, N. C. is the first recipient of the award.

Superintendents Meeting Dates

DATE	DIVISION	PLACE
Jan. 26	Miami Valley Div.	American Legion Hall, Middletown, Ohio
Feb. 18	Michigan Div.	Hotel Harris, Mich.
May 6-7	Northwestern Div.	Leamington Hotel, Minneapolis, Minn.
May 14-15	Penjerdel, Spring Meeting	Yorktowne Hotel, York, Pa.
May 20-21	Pacific Coast Joint TAPPI	Gearhart Hotel Gearhart, Ore.
June 21-23	National	Sheraton-Mount Royal Hotel Montreal, Que.

TAPPI Meeting Dates

DATE	SECTION	PLACE
Jan. 28	Delaware Valley	Engineers Club 1317 Spruce Street, Philadelphia, Pa.
Feb 5	Central District Empire State	University Club, 431 E. Fayette St., Syracuse, N.Y.
Feb. 11	Ohio	Manchester Hotel, Middletown, Ohio
Feb. 11	Northern District Empire State	Watertown, N.Y.
Feb. 19	Lake Erie	Carter Hotel, Cleveland, Ohio
Mar. 9	Lake States	Tour of Wausau Paper Mills, Brokaw, Wis.
Mar. 19	Pacific	Tacoma, Wash.
Mar. 19-20	Southeastern	George Washington Hotel, Jacksonville, Fla.

Kalamazoo TAPPI to Meet Feb. 4

The February dinner meeting of the Kalamazoo Valley Section of TAPPI will be held February 4, at the Hotel Harris, Kalamazoo, with dinner at 6:30 P.M.

J. C. Barthel, Assistant Technical Director—Paper Chemicals Department, American Cyanamid Co., New York, will present a talk on "Alkaline Sizing." Mr. Barthel is a graduate of the Pulp & Paper School of Syracuse University. He started his paper career with the Oswego Falls Paper Co. in 1933.

Morris Gintzler

Wood Pulp Importers Honor Gintzler

Morris Gintzler, recently retired chairman of the Board of Pulp and Paper Trading Co., was unanimously elected to honorary membership in the American Wood Pulp Importers Assn.

He becomes the first person to be so honored by the Association. Mr. Gintzler has been active in the wood pulp business for approximately sixty years. He started in 1894 with Frederick Bertuch & Co. When J. Andersen & Co. was founded January 1, 1912, as the successor to Frederick Bertuch, Mr. Gintzler was a partner. At the same time he was connected with Pulp and Paper Trading Co. since its establishment in 1904, He remained with this firm until his retirement at age 77 as Chairman of the Board in September 1953. Mr. Gintzler graduated from New York Law School in 1901 and was admitted to The Bar in 1902. He was very instrumental in arranging the incorporation of The Assn. of American Wood Pulp Importers in 1911 and feels that one of its most important accomplishments is that it established a uniform contract for the sale of wood pulp by members of the Association. In 1953 Mr. Gintzler was decorated by the King of Norway and given the Order of St. Olav.

Highlights of TAPPI Meeting

The 39th Annual Meeting of the Technical Association of the Pulp and Paper Industry will be held at the Commodore Hotel, New York, N. Y., on February 15-18, 1954.

FEBRUARY 15

"The Paper Industry in the Far East," by Roland A. Packard, Washington, D. C.

"Fiberglas as a Papermaking Material," by Thomas S. Chambers, Owens-Corning Fiberglas Co., Newark, Ohio.

"Manufacture of Board Continuously by a Dry Process," by R. S. Aries Fibreboard Corp., New York, N. Y.

"A Laboratory to Coordinate Science and Manufacturing Operations," by Reavis C. Sproul, Herty Foundation, Savannah, Ga. (by title).

FEBRUARY 16

Symposium—"The Easy Opening Box"

"Application of Gummed Tear Tape on the Semi-automatic Taping Machine," by Foster Lowery, Universal Corrugated Box Machinery Co., Linden, N. J.

"Pressure Sensitive Tear Tape and Its Application to the Weber Machine," by E. L. Decker, Minnesota Mining & Mfg. Co., St. Paul, Minn.

Paper by Walter Friedman, General Gummed Products Co., Richmond Hill, N. Y.

Digester Corrosion

"The History of Carbon Brick Linings in Alkaline Pulping Digesters," by Beaumont Thomas, Stebbins Engineering & Mfg. Co., Watertown, N. Y.

"A Laboratory Approach to the Study of Digester Corrosion," by J. W. Hassler, West Virginia Pulp & Paper Co., Tyrone, Pa.

"Experiments with Digester Corrosion Variables," by E. W. Hopper and J. M. Morrison, Crucible Steel Co. of America, Pittsburgh, Pa.

"Field Investigation of Corrosion in Alkaline Pulping Equipment," by C. B. Christianson, Pulp and Paper Research Institute of Canada, Montreal, P. Q.

"Bibliography on Alkaline Digester-Corrosion," by R. P. Whitney, Institute of Paper Chemistry, Appleton, Wis., and S. J. Baisch, Thilmany Pulp & Paper Co., Kaukauna, Wis. (by title).

Papermaking (Fourdrinier)

"Weight Profile Measurement of Paper and Machine Clothing with the Tracerlab Beta Ray Scanner," by James D. Sadtler and H. Borofsky, Southland Paper Mills, Lufkin, Tex.

"Beta Gauge Basis Weight Control," by Fred W. Rauskolb, Industrial Nucleonics Corp., Columbus, Ohio.

"Load Meters, Tension Meters and Torque Meters for Paper Machines," by John C. Harper and T. A. McArn, Downington Mfg. Co., Downington, Pa.

"An Experimental Study of the Factors Involved in the Manufacture of Paper Yarn," by Geoffrey Broughton, University of Rochester, Rochester, N.Y., and James P. Wang, Lowell Technological Institute, Lowell, Mass.

"The Mechanical Properties of Paper," by Geoffrey Broughton and James P. Wang (by title).

Structural Fibrous Materials

"The Importance of Speed of Test on Bending Strength Properties of Insulating Board," by Wayne C. Lewis, Forest Products Laboratory, Madison, Wis.

"Evaluation of the TAPPI-SFMC Drainage Time Tester for Mill Control of Insulating Board Pulps," by W. H. Graham, Johns-Manville Products Corp., Natchez, Miss.

"A Comparison of the TAPPI-SFMC Drainage Time Test Procedure with Olin Methods," by D. R. P. Haig, Johns-Manville Research Center, Manville, N. J.

"Evaluation of the TAPPI-SFMC Drainage Time Tester of TAPPI T 1002 sm-51," by Jules J. Perot, Flintkote Co., Whippany, N. J., and C. E. Hrubesky, Forest Products Laboratory, Madison, Wis.

Panel Discussion: J. J. Perot, Moderator, Thure Duval, Wood Conversion Co., Sloquet, Minn., C. E. Hrubesky, and D. R. P. Haig.

"Smoothness of Paperboard" (a symposium).

(a) "Scope of the Problem," by G. T. Renegar.

(b) "End Use Requirements and Testing for Smoothness," by A. T. Luey, Sutherland Paper Co., Kalamazoo, Mich.

(c) "Finishing and Drying," by K. M. Winrich, Cornell Paperboard Products Co., Cornell, Wis., and Peter Smith, Continental Paper Co., Ridgefield Park, N. J.

(d) "Wet End Aspects," by G. C. Ehemann, Ohio Boxboard Co., Rittman, Ohio.

(e) "Stock Preparation," by E. F. Manogue, Gibraltar Corrugated Paper Co., North Bergen, N. J.

(f) "Raw Materials Problems," by A. E. Bachmann, Missisquoi Corp., Sheldon Springs, Vt.

Acid Pulping

"The Resistance of Douglas-Fir to Sulphite Pulping," by William H. Hoge, Oxford Paper Co., Rumford, Me.

Panel on Acid Pulping—G. H. McGregor, Minnesota & Ontario Paper Co., International Falls, Minn., Moderator.

(a) "Acid Sulphite Pulping with Bases Other Than Calcium," by R. S. Hatch, Hudson Pulp & Paper Co., Palatka, Fla.

(b) "Acid Sulphite Pulping of Other Than Normal Species, Such as Highly Resinous Woods and Deciduous Woods," by G. H. McGregor.

(c) "High Yield Acid Sulphite Pulping," by L. R. Beath, Price Bros. & Co. Ltd., Riverbend, P. Q.

(d) "Sulphite Pulping and as Related to Stream Problems in Eastern U.S.A.," by V. P. Edwardes, Corinth, N. Y.

(e) "Sulphite Pulping and Stream Problems in the Pacific Northwest," by H. R. Amberg, National Council for Stream Improvement, Corvallis, Ore.

(f) "Sulphite Pulping and Stream Problems in the Mid-west," by N. L. Malcove, Northern Paper Mills, Green Bay, Wis.

"Vapor-Liquid Equilibria in the System NH_3—SO_2—H_2O," by D. T. Hayden, A. L. Babb and Joseph L. McCarthy, University of Washington, Seattle 5, Wash.

Symposium—"High Humidity Containers"

"Requirements of Packages in the Cheese Industry," by L. J. Hayhurst, Kraft Foods Co., Glenview, Ill.

"Corrugated Adhesives for Use with High Humidity Containers Such as Those with Sulphur Impregnated Corrugating Medium," by Claude H. Fletcher, Corn Products Sales Co., Kalamazoo, Mich.

"Case Sealing Adhesives for High Humidity Container Storage," by W. Sederlund, National Starch Products, Inc., New York, N. Y.

"Laboratory Evaluation Procedures and Field Tests on High Humidity Containers," by C. J. Zusi, Container laboratories, Chicago, Ill.

Panel — "Operating Problems and Field Experience with High Humidity Containers"—led by D. Shepard, Jr., Menasha Wooden Ware Corp., Menasha, Wis.

Papermaking (Fourdrinier)

"An Investigation of Methods for Dimensionally Stabilizing Paper," by Frank Lorey, Mead Corp., Chillicothe, Ohio.

"Consistency Regulator Installations," by David Dezurik, Dezurik Shower Co., Sartell, Minn.

"The Coordinate Role of Alum in the Sizing of Paper," by R. M. Karapetoff Cobb and D. V. Lowe, Lowe Paper Co., Ridgefield, N. J.

"Effects of Mechanical Preparation and pH on the Strength of Glass-Fiber Paper," by M. J. O'Leary, R. B. Hobbs,

J. K. Missimer, and J. J. Erving, National Bureau of Standards, Washington, D. C.

"Studies of Rosin Sizing by Means of Autoradiography and Electron Microscopy," by Charles H. Hook, Hercules Powder Co., Wilmington, Del.

Film — "Weaving Wisconsin Wires," by James E. Watson, Wisconsin Wire Works, Appleton, Wis.

FEBRUARY 17

Symposium—"Heat Balance and Its Effect on Corrugated Board"

"Steam System on Combiners," by Paul Harrison, Velocity Steam Production Engineering, Chicago, Ill.

"The Hot Oil System," by R. Casper, Swaney Mountain State Fabricating Co.

"Detrimental Effect of Either Excessive Heat or Insufficient Heat on Corrugated Starch Bond," by C. R. Vander Meulin, Penick & Ford, Inc., Cedar Rapids, Iowa.

"The Conventional Trap Steam System," by Charles Nitchie, Samuel M. Langston Co., Camden, N. J.

"The Cochrane C. D. System," by R. J. Lundrigan, Cochrane Corp., Philadelphia, Pa.

Papermaking (Cylinder)

Review of symposium on "Smoothness of Paperboard," by Glen T. Renegar.

Consideration of Cylinder Machine Paper Defects, Lumpy Formation, Felt Marks, Wire Marks, Foreign Matter (Shives, Shivespots), Fuzziness, Interfiber Voids, Cockles, Surface Pick (at Calenders), Check and Crush Mechanical Damages, Compressibility.

Pulp Purification

"A New Process for the Bleaching of Chemical Pulps, Especially Kraft, with Peroxide," by W. F. Schroeder, National Distillers Chemical Corp., Ashtabula, Ohio.

"Bleaching with Chlorine Dioxide," by W. D. Harrison, Riegel Paper Corp., Milford, N. J.

"Chromatographic Techniques in the Analysis of Purified Pulps," by J. F. Saeman, W. E. Moore, and R. L. Mitchell, Forest Products Laboratory, Madison, Wis.

"A Comparison of Processes for Manufacturing Chlorine Dioxide in Pulp Mills," by W. Howard Rapson.

Statistics

"The Simultaneous Process Control of Two Tests," by Geofirey Beall, University of Connecticut, Storrs, Conn., jointly with Truman A. Pascoe, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

"Some Examples of Designed Experiments in Industry," by Charles A. Bicking, Research & Development Div., Office of the Chief of Ordnance, Washington, D. C.

"Quality Control in Envelope Manufacture," by J. Rex Adams, Old Colony Envelope Co., Westfield, Mass.

"A Multiple Correlation Ranking Method," by T. H. Geiger, Oxford Paper Co., Rumford, Me.

"Determining Capability, Control and Achievement in the Paperboard Industry," by Paul C. Clifford, Consultant on Quality Control, Montclair, N. J.

Testing

"The Effect of Copper and Base Concentrations in Cellulose Solvents," by B. L. Browning, Institute of Paper Chemistry, Appleton, Wis.

"Prediction of Brightness of Groundwood-Sulphite Mixtures," by D. J. MacLaurin, Institute of Paper Chemistry, Appleton, Wis., and F. A. Aflenzer, Institute of Pulp and Paper Technology, Graz, Austria.

"Methods for Cellulose Accessibility Determination," by Geoffrey Broughton, E. Heekgaret, and Conrad Johannes, University of Rochester, Rochester, N. Y.

"Photometric Determination of the Solubility of Pulp in Sodium Hydroxide Solutions," by Ralph M. Kingsbury, Forest Products Laboratory, Madison, Wis.

"How Retention and Wet Strength are Related to the Catonic Character of Urea-Formaldehyde Wet-Strength Resins," by J. Vernon Kindall, Plaskon Div., Libbey-Owens-Ford Co., Toledo, Ohio.

Corrugated Containers

General Technical Session (speakers to be announced).

Statistics

"Quality Control Rates Raw Material Suppliers," by W. A. MacCrehan, Jr., Bendix Radio Div., Bendix Aviation Corp., Baltimore, Md.

"Estimating Variance Components in Processing a Paper Roll," by Geoffrey Broughton and S. Lee Crump, University of Rochester, Rochester, N. Y.

"Control Chart for Newsprint Web Breaks," by Sol Steinberg, New York *Times*, New York, N. Y.

"Some Interesting Mill Problems Solved," by Leonard Marasculio and Truman A. Pascoe, Nekoosa-Edwards Paper Co., Port Edwards, Wis.

"Quality Control in Containers Processing," by Warren Purcell, Rath & Strong, Industrial Consultants, Boston, Mass.

"A Study of Basis Weight and Caliper Variation," by Maynard S. Renner, Dewey and Almy Chemical Co., Cambridge, Mass.

Chemical Engineering

"Corrosion Problems in Bleach Plants Using Chlorine Dioxide," by H. O. Teeple, International Nickel Co., New York, N. Y.

"The Correlation of Evaporation and Brown Stock Washing," by W. G. Detert and R. E. Bergstrom, Swenson Evaporator Co., Harvey, Ill.

"Some Aspects of Permeation, Filtration, and Fluidization," by Roy P. Whitney, W. L. Ingmanson, and S. T. Han, Institute of Paper Chemistry, Appleton, Wis.

Semichemical Pulping

"Effect of Cooking Conditions in Neutral Sulphite Pulping of Sweetgum," by J. J. Owen, Jr., E. J. McCue, and R. R. Chase, Union Bag & Paper Corp., Savannah, Ga.

"An Orienting Study of the Effect of the Neutral Sulphite Semichemical Cook on the Hemicelluloses of Aspenwood," by David C. Lea, Potlatch Forests, Inc., Lewiston, Idaho.

"Report of Subcommittee on Semichemical Pulping Equipment Survey," by J. E. Sapp, Gaylord Container Corp., Bogalusa, La.

"Properties of Semichemical Pulps," by E. H. Shriver, Mead Corp., Chillicothe, Ohio.

FEBRUARY 18

Pulps for Chemical Conversion

"Problems in the Evaluation of the Caustic Absorbency of Pulp Sheets," by R. W. Swinehart and A. T. Maasberg, Dow Chemical Co., Midland, Mich.

"A Cellulose Yield Test Overcoming the Inadequacies of the Alpha Test," by Frank R. Charles, Industrial Cellulose Research Ltd., Hawkesbury, Ont.

"Viscose Filter Number Evaluation of Cellulose Pulps," by E. L. Hanson and L. M. Cook, The Visking Corp., Chicago, Ill.

"Investigation of the Haze in Cellulose Acetates Made from Wood Pulps," by Keith E. Bradway, Camp Mfg. Co., Franklin, Va.

"Effect of Medium in the Acetylation of Cellulose," by R. C. Blume and F. H. Swezey, E. I. du Pont de Nemours & Co., Waynesboro, Va.

"Carbohydrates in Woods and Pulps by Chromatographic Analysis," by Albert Z. Conner, Hercules Powder Co., Wilmington, Del.

"Purified Hardwood Pulps for Chemical Conversion. II. Prehydrolysis-Sulphate Pulps from Sweetgum," by F. A. Simmonds, J. S. Martin, and R. M. Kingsbury, Forest Products Laboratory, Madison, Wis.

Water

"Condensate Corrosion — Its Causes and Prevention," by Seldon K. Adkins and Maurice F. Nielsen, National Aluminate Co., Chicago, Ill.

"The Continuous Preparation and Application of Silica Sols in the Paper Industry," by L. L. Klinger, Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis.

"The Accelerated Biological Oxidation of Kraft Mill Effluents," by Fred

W. Bishop, Southland Paper Mills, Lufkin, Tex.

"The Aerobic and Benthal Oxygen Demand of Paper Mill Waste Deposits," by Nicholas Lardieri, National Council for Stream Improvement, New York, N. Y.

"Stream Pollutional Aspects of Mill Antiseptics," by W. M. Van Horn, Institute of Paper Chemistry, Appleton, Wis.

"The Biological Inactivation of Mercurials by Pulps," by B. F. Shema, Institute of Paper Chemistry, Appleton, Wis.

Alkaline Pulping

"The Effect of Alkaline Pulping on the Lignin of *Eucalyptus regnans*," by J. W. T. Merewether, Australian Paper Manufacturers, Ltd., Melbourne, Australia.

"Lime Sludge Recovery in the Pulp Industry," by W. Tock, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

"A Theoretical Treatment of Liquor Handling in Continuous Pulping," by W. J. Nolan, University of Florida, Gainesville, Fla.

"The Use of the Peabody Scrubber on Lime Kiln Stack Gases," by Paul Mockridge, Peabody Eng. Corp., New York, N. Y.

"The Effect of Bark in the Sulphate Pulping of Northern Oak Mixture," by K. I. Brown, Forest Products Laboratory, Madison, Wis.

"Screening of Sulphate Pulp," by Doyle Dykes, Macon Kraft Co., Macon, Ga.

Testing

"The Interrelation of Fiber Length Distribution, Fiber Length Index, and Physical Characteristics of Hand Sheets," by A. H. Nadelman, R. Schmut, D. J. Kraske, and R. I. Larson, Western Michigan College, Kalamazoo, Mich.

"The Measurement of Wet Web Strength," by L. M. Lyne and W. Gallay, E. B. Eddy Co., Hull, P. Q.

"Studies in the Fundamentals of Wet Web Strength," by L. M. Lyne, and W. Gallay.

"The Development and Use of the Chapman Printing Smoothness Tester," by S. M. Chapman, Pulp and Paper Research Institute of Canada, G. R. Sears, Institute of Paper Chemistry, and D. N. Obenshain, West Virginia Pulp & Paper Co.

"Development of Method for Measuring the Gloss of Very Glossy Paperboard," by R. S. Hunter, Hunter Associates Laboratory, Falls Church, Va.

"A Study of the Effects of Instrumental Variables on 75° Specular Gloss," by L. W. Zabel, Kimberly-Clark Corp., Neenah, Wis., and W. A. Wink, Institute of Paper Chemistry, Appleton, Wis.

HEAD TABLE PERSONALITIES— (L to R) Leon Mimms, chairman of Michigan Supers; Leonard Pierce, toastmaster of the Joint Meeting; George Olmsted, main speaker; Reginald Hurst, chairman Kalamazoo TAPPI.

S. D. Warren President Outlines "The Task Ahead" At Joint Kalamazoo Meeting

More than 400 paper industry leaders and technicians received January 14, a detailed chart of the course they must follow to maintain the front position they have held the last 30 years in industrial progress last night. It was mapped for them by George Olmsted, Jr. president of the S. D. Warren Co., Boston, Mass. The occasion was the 19th annual Kalamazoo Valley Papermakers Get-Together at the Hotel Hanis Joint sponsors were the Michigan Division of the American Pulp and Paper Mill Superintendents Association and the Kalamazoo Valley Section of TAPPI.

Olmsted was introduced by Leonard A. Pierce, Jr., resident manager of the St. Regis Paper Co. mill in Kalamazoo. Pierce declared the Warren company to be one of the most progressive in the industry today. As proof, he cited its soda recovery plant that "may well be the best of its kind in the world" and its portable cities for use of loggers when the company's lumber camps are moved from one woods area to another.

Olmstead outlined three objectives for paper manufacturers in "The Task Ahead." First, he declared, they must hammer down costs. Secondly, they must create new products for new customers in new fields. Third, they must select the right technical men and enough of them to keep the paper industry growing.

"It's technical leadership that counts," the speaker declared. "When you hire a man today, you determine what your company and the paper industry will be 25 years from now," he emphasized. "You have just started this fascinating game of finding substitutes for other materials in paper. Real work in this field was started by the paper industry as recently as the early 1940's.

"Since it usually takes a new laboratory 15 years to obtain results, it follows that the real work of these units will be starting to become apparent in 1955."

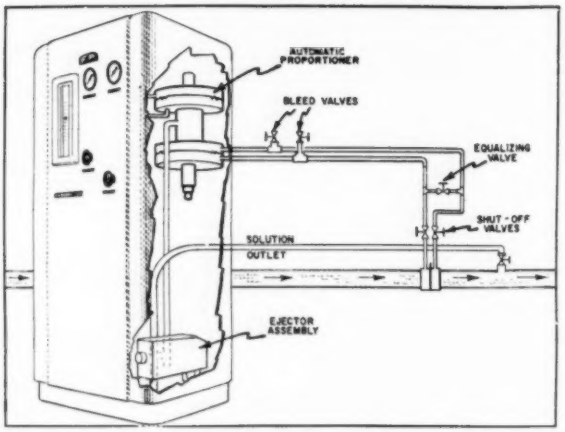
Everyone gets into the act in obtaining patents for new paper applications, he declared, but it is up to the research men to develop the uses and processes after the patents are obtained.

Outstanding opportunities lie in substitution of paper for other materials, he declared. Among these fields, particularly, the speaker cited metal, cloth, acetate film and cans. The paper business is becoming more and more a chemical operation and less and less, mechanical, the mill executive said.

Pierce provided the group with several hearty laughs as master of ceremonies. He also introduced industry leaders at the speaker's table. These included: Frank Roberts, resident manager of the Warren mill at Muskegon; Olin Callighan, Edgar Brothers Clay Co. first vice president of the national Industrial Affiliates organization; Marshall H. Rutz, Kalamazoo Vegetable Parchment Co., treasurer of Michigan APPMSA; Claude Bos, St. Regis, second vice-chairman, APPMSA; Harrison Kindig, Mac-Sim-Bar Paper Co.,

Leon H. Mimms, chairman Kalamazoo Paper Co., APPMSA; Ray Barton, Michigan Paper Co., national trustee of APPMSA; William Hathaway, KVP, national executive board, TAPPI; Robert T. Elias, Western Michigan College; treasurer, Kalamazoo TAPPI; Arthur J. Dean, Michigan Paper Co., vice-chairman, Kalamazoo TAPPI; Harry E. Weston, Chicago, national secretary-treasurer, APPSMA, R. G. Macdonald, New York, national secretary, TAPPI; Reginald H. Hurst, KVP, chairman, Kalamazoo APPI, Richard T. Trelfa, Watervliet Paper Co., secretary, TAPPI, and Olmsted.

NEW EQUIPMENT AND SUPPLIES



Automatic Proportioner for Chlorinators

A corrosion resistant automatic proportioning component for chlorinators has been developed by Fischer & Porter, 20 Jacksonville Rd., Hatboro, Pa., to feed chlorine to water or sewage lines in a direct and preset proportion to the flow rate, however it may vary. For use with the company's standard and high capacity vacuum-type, solution feed chlorinators, the automatic proportioner can be incorporated to make the conversion from manual rate adjustment either before shipment or after the chlorinator has been in use.

The proportioner is operated by differential pressure coming directly from an orifice plate. Once an initial setting for a desired proportion of chlorine is made manually on the chlorine rate valve, the automatic proportioner takes over. The pressure is converted to a force by means of a diaphragm. This variable force changes loading of the chlorine gas differential pressure regulator within the proportioning unit. In response, the pressure drop across the chlorine rate valve changes so as to vary the chlorine flow in direct proportion to the flow of water to be chlorinated.

Two proportioner models are available for standard and high capacity chlorinators. They are available in two standard differential ranges: 0-50 inches and 0-100 inches water column. Resistance to corrosion by moist or dry chlorine gas and to chlorine solution is said to be assured by such construction materials as tantalum, Hastelloy "C", Uscolite, Teflon, Kel-F, Tygon and glass.

Redesigned Tester & Fuse Puller

The No. 71 Hi Tester & Fuse Puller is a newly designed electrician's tool made by Holub Industries, Inc., Sycamore, Ill. Made of transparent red tenite, it can be used as a tester on circuits from 100 to 600 volts a.c. or d.c. As a fuse puller, it is said to eliminate the danger of inserting or removing cartridge fuses (up to 100 A) by hand.

For use as a tester, the tool is supplied with two 24-inch plastic covered, flexible test leads. The end of one lead has a 4-inch prod with plastic handle. The other has a spring clip with a safety rubber jacket.

The test light is a small neon unit with two electrodes and a resistor. One electrode glows on d.c.; both glow on a.c. The length of the tool is 7-½ inches; its weight is 3 ounces.

Load Lift for Single Or Double-Faced Pallets

The Market Forge Co. materials handling Div., 35 Garvey St., Everett 49, Mass., is now in production on the one-ton Model SD Combination Pallet Load Lift to handle either single faced pallets or double faced pallets. The length of this truck, not including the forks, is 13 inches. Forks are made from 24" to 72 inches long. The lowered height of the truck is 3-¼ inches and truck has a full lift of 4 inches. The overall width outside of the forks is 22 inches; the width of each fork is 7¼ inches. The opening between forks is 7-½ inches. The tandem wheels, which carry the load, are each 3-¼ inches in 2-inch diameter by face. Wheels are available in aluminum, cushion rubber and plastic.

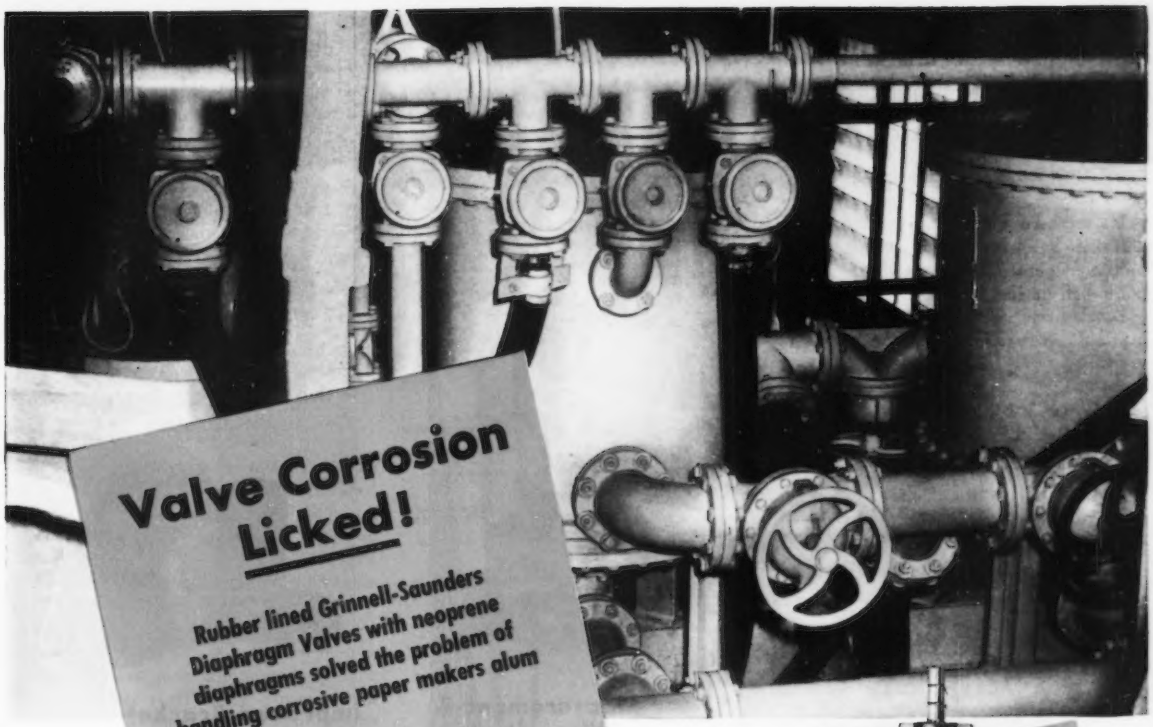
This lift was designed particularly to handle pallets which are tiered. It requires less than a 30 pound pull on a level hard concrete floor to move the truck. It also requires less than 25 pounds effort on the lifting handle to raise the load. The truck is made of all-welded steel and certified malleable iron.

Two Units for Multiple Chart Recording

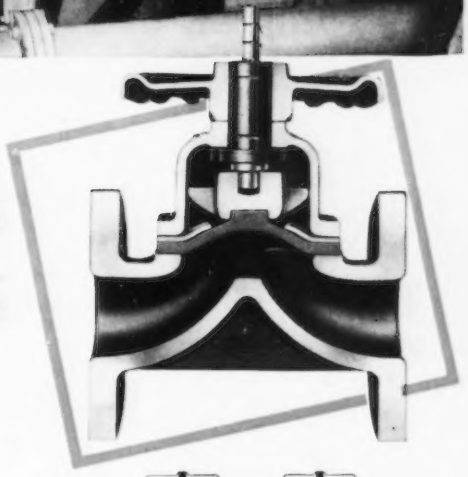
Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th. St., Philadelphia, Pa., has introduced two new models: of chart recorders the Fielden Tektolog and the Null Balance Recorder. It is claimed that both are capable of gathering operating data from 24 separate sources and logging the collective information on a single circular chart.

These instruments can be directly coupled to tachometers, resistance thermometers, conductivity cells, strain gauges, carbon dioxide indicators, pH meter, etc., to produce a permanent record of operating speed, temperatures, PH values, etc. In a number of industrial applications a single multi-point recorder will adequately take care of every recording requirement it is said.

Recording in either instrument is achieved through a six-point turret pen mechanism which traces six different colors. By dividing the standard circular chart into four equal parts and installing a mechanism to rotate the chart periodically, data from six separate points can be logged in each quarter. A standard


Valve Corrosion Licked!
Rubber lined Grinnell-Saunders Diaphragm Valves with neoprene diaphragms solved the problem of handling corrosive paper makers alum

GRINNELL-SAUNDERS DIAPHRAGM VALVES

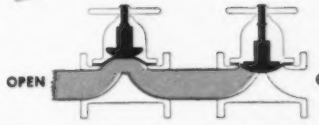


Commercial aluminum sulphate *can be everlastingly troublesome,* as anyone knows who has ever had to work with it. So, comparing notes with a company that handles this chemical every day of its business life may be helpful.

Northern Chemical Industries, Searsport, Me., is an important manufacturer of "paper makers alum". Northern Chemical Industries relies heavily on Grinnell-Saunders Diaphragm Valves. They have found that the wide range of body, lining and diaphragm materials available with Grinnell-Saunders valves offers flexibility in handling a wide variety of corrosive fluids.

The basic design of the valve is an advantage. Working parts are completely isolated from the fluid stream which, in the case of corrosive acids, means longer valve life. Also, there is the matter of economy. With Grinnell-Saunders Diaphragm Valves, it is usually possible to go to less expensive body materials, to which special body linings can be added. Replacement and maintenance expenses, moreover, are greatly reduced.

Originally designed and ideally suited for air and water service, Grinnell-Saunders Diaphragm Valves also are recommended for almost every regular or special service. This is backed up by the excellent performance records achieved by valves now in use.



Features of Grinnell-Saunders Diaphragm Valve:

- Diaphragm absolutely isolates working parts from fluid
- Diaphragm lifts high for streamline flow in either direction
- Diaphragm presses tight for positive closure
- Body, lining and diaphragm materials to suit service
- Simple maintenance — diaphragm easily replaced without removing valve from line

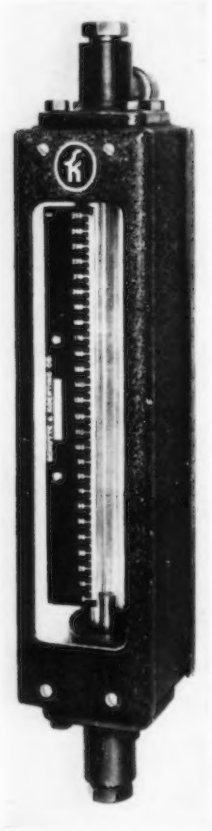
GRINNELL
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems

synchronous chart drive motor keeps the chart "in time", so that each quarter of the chart may be made to correspond to a 1 hour, 8 hour, 24 hour, or 7 day period. The print cycle is 5 seconds per point and the total cycle for all 24 points is only two minutes. A convenient feature never before offered in any other multipoint recorder allows the cycling mechanism to be switched off, permitting the unit to operate as a standard single-point pen inking recorder.

Data sheets and Bulletin F-452M are available on request from the manufacturer.

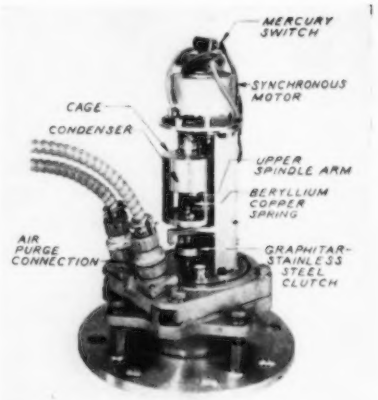


Safety Features Added to Flow Meter

A rate-of-flow measurement meter for liquids and gases has been redesigned by Schutte & Koerting Co., Dept. M-D, Cornwell Heights, Bucks City, Pa. Known as the Safeguard Rotameter, it is equipped with detachable safety glass windows to protect the metering tube from external shock and act as a safeguard in the event of accidental tube breakage.

The unit is enclosed in a steel case and can accommodate up to four sizes of meter tubes in the one case. The rotor is designed for a range of capacities within one meter size. The metal reference scale is available with calibrations either in units of flow, or in millimeters for use with calibration charts. The scale piece is metal and is detachable.

It is said that the meter can be adapted for electrical or pneumatic transmission and remote recording of fluid rate of flow. Complete specifications are contained in manufacturer's Bulletin 18-RG, available on request.



Unit for Measurement & Control of Viscosity in Coatings & Slurries

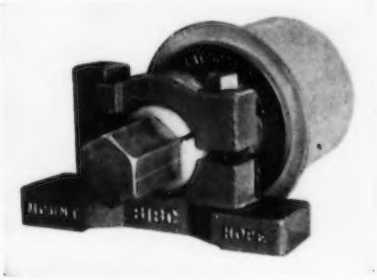
Said to have been successfully applied to continuous viscosity measurement of such process materials as paper coatings, glues, polyvinyl acetate solutions, homogenized starch etc., the Viscometran is now marketed by Brookfield Engineering Laboratories, Inc., Technical Applications Div., 240 Cushing St., Stoughton, Mass.

When the unit is in operation, a spindle is rotated by a synchronous motor at a constant speed in the liquid under test. The torque required to produce this rotation is directly proportional to the centipoise viscosity of the fluid. Utilizing either a variable capacitance or a variable resistance, the instrument transmits a viscosity signal to a suitable receiver by sending an electrical impulse proportional to the torque required to rotate the spindle.

Viscosity is measured at a constant rate of shear since the spindle of the instrument rotates at a constant speed. Non-Newtonian fluids (such as slurries, emulsions or paints) have a viscosity which will vary unpredictably with the rate of shear at which they are measured. Measurements at too high or too low a shearing rate it is explained, are not likely to show clearly the difference between many such materials. Measurements at a varying rate of shear fail to relate viscosity to any reference point and merely indicates an "averaging" effect. Experience shows, say the makers, that the rates of shear possible with this instrument will indicate the desired differences in a varying sample of non-Newtonian material. (This has been noted with such typical fluids as starch solutions and paper coatings.)

The instrument may be used for applications involving base mount temperatures up to 200 degrees F. and in a vacuum from 8 m.m. of mercury to pressures of 100 p.s.i. All moving parts are mounted on rigid aluminum castings and are enclosed by a 3/32-inches steel valve cap.

The unit is mounted on a 4 inch, 125-pound standard American pipe flange. It may be used on either a tank, kettle, or in a flow line by-pass.



Improved Bracket For Expander Roll

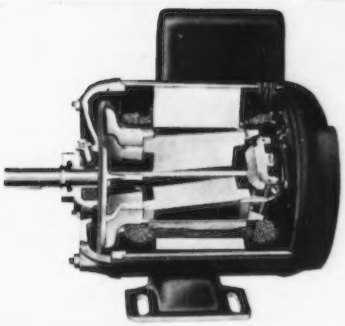
Mount Hope Machinery Co. 15 Fifth St. Taunton, Mass., has developed improved mounting brackets for the company's Free Wheeling Expanders. The operator can now take the expander from a machine, according to the manufacturer, with very little loss of time in removing the bracket. The construction of the bracket is also said to save space. Adjustment is simplified, and rotation is rendered much easier by the new bracket it is further claimed. Called the Mount Hope Model MNP bracket, it consists of two simple elements of malleable iron, with a single clamping bolt and nylon ball clamp.

Resin to Improve Wet Strength, Fold, and Scuff Resistance

The Borden Co., Chemical Div., 350 Madison Ave., New York 17, N.Y., is now offering a new resin designed to improve wet strength, folding endurance, and scuff resistance in finished papers. Known as PR-165, the resin is particularly recommended for treatment of toweling stock, since it is said to strengthen the paper without affecting its absorbency.

The maufacturer states that the resin develops about 75 per cent of its ultimate cure as the paper leaves the machine, reaching full cure in 14 to 21 days. Full cure may be hastened by storing the paper in a warm room for several days.

It is further explained that the resin is fast curing and combines quickly with the cellulose fibers.



Rerated Line Of F.H.P. Motors

Fractional horsepower motors in the rerated design are now being produced by Century Electric Co., St. Louis 3, Mo. Designated Century Form F, these motors are said to furnish equivalent horsepowers in smaller frames than their former models.

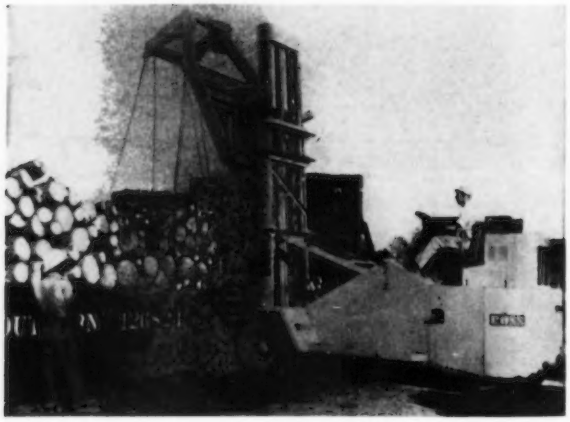
The motors are available as Type S.P., split phase single phase induction motors for general purpose applications; Type C.S. capacitor start single phase induction motors for hard to start applications such as pumps, compressors, machines starting loaded, etc.; Type S. C. squirrel cage polyphase (3 or 2 phase) induction motors for all general purpose applications. Further information is contained in manufacturer's bulletin 1-5.

Cabinet for Testing Temperature and Humidity

A new model, 15-CF Atmosphere Control Cabinet is now available from Package Materials Laboratories, Inc., 461 Crescent Rd., Hatboro, Pa. The unit is offered for any type of moisture-vapor tests within the limits of minus 20 degrees F. and plus 200 degrees F. with a relative humidity of 18 per cent to slightly under 100 per cent.

This type of cabinet is offered primarily for testing packaging materials, plastics, chemical materials, greases, or any other materials that may be affected by temperature and/or humidity.

10
NASH VACUUM PUMPS
are simple
One moving part. No valves, no pistons, no timing gears, no internal lubrication. This makes possible important operating advantages no other type pump offers.
Plus—
NASH
PAPER MILL
KNOW-HOW
NASH ENGINEERING COMPANY
414 WILSON AVE., SO. NORWALK, CONN



Pulpwood Loader Sets Two Bundles Across Flat Car From One Side

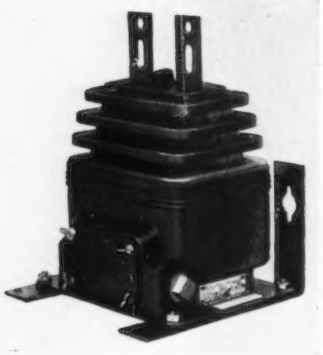
A pulpwood loading device which enables the operator to load both sides of a flat car from one side and which carries a pay load of 9000 lbs. has been announced by the Clark Equipment Co. Industrial Truck Div., Benton Harbor, Mich. Named the Pulploader, the device is offered as an attachment for the Ross Series 15LH fork lift truck.

Hydraulic operation of the loader is controlled from the driver's seat. The device tilts 92½ inches from the vertical and can be raised to a height of 26 feet 10 inches. Spliced load cables support the load and are freed through operation of a hydraulic hook release. A unit of pulpwood, usually 1-¾ cords, can be lifted from a truck and placed on a flat car in one operation.

In operation, the loader is lowered over the unit of pulpwood and its cables are slipped under each end and hooked together under the unit. The unit is then hydraulically raised clear of the truck and the fork-lift tower is tilted into its backward position, allowing the unit to rest against a bumper grill which evens the face of the load.

The fork-lift is then moved to the flat car and the load is lowered into place, either on the near side or the far side of the car. When the load is in position, the cable hooks are disengaged by trip cables actuated by a hydraulic cylinder on the crane arm and controlled by the driver. Cables are withdrawn from the load by raising the Pulploader until the cables are clear. The operator can then even the load by bumping pretruding sticks with the heavy bumper grill it is said.

The unit is of all steel welded construction. The cables are hand spliced to prevent fraying. The extra heavy bumper grill measures 78 inches high and 84 inches wide. The device is not available for export.



Butyl-Molded Transformer For Out-Door Mounting

A butyl-molded current transformer for outdoor applications up to 5,000 volts is now being produced by General Electric Co., Meter & Instrument Dept., Schenectady 5, N. Y. Smaller and lighter than previous models, the new Type JKW-3 transformer is said to represent the first successful application of the butyl process to transformers of the higher-voltage outdoor type.

The manufacturer explains that possible bushing breakage has been reduced by the use of butyl instead of porcelain as construction material. The necessity of gaskets and/or welding is eliminated since the bushing and case form a homogeneous whole. The small size and lighter weight of the new transformer facilitates mounting in any feasible position.

The secondary terminal box is molded in the case as an integral part of the transformer and with the butyl acting as a gasket, the aluminum cover provides water-tight protection.

Primary coils are of the "figure 8" type. Low core losses and high accuracy result from the interleaved, high-permeability silicon-strip steel core, it is said.

Lightweight Style of Shatterproof Spectacles

Shatterproof, multi-purpose safety spectacles, called Visor-Tuc Eye Savers, for worker protection from eye injuries, are said to weigh hardly more than an ounce. Over-eyes protection from glare and flying particles is provided by the built-invisor, an extension of the frame, shaped to fit against the wearer's forehead. Injury from side or bottom is prevented, it is said, by "semi-cup" lenses, so called of lens-flanges extending from the lenses toward the cheek. The spectacles are made by Watchemoket Optical Co., 232 W. Exchange St., Providence, R. I.

They are made in a single frame style that fits all workers. This feature is made possible by a nosepiece which rests lightly on the nose and by ear pieces which can be adjusted by each wearer to suit the shape of his face. The methacrylate lenses are replacable yet securely locked in place. Lenses are described as optically correct to prevent eye strain and permanent injury resulting from distortion of the image. They are available in clear and three shades of green: light, medium and dark.

American Tissue Warehouse Sold

Aaron Krok Associates, new owners of the American Tissue Mills, Inc., have sold the company's storage building on Wonter St., Holyoke, Mass. to Downing Realty Corp. The Downing concern has leased the property to Plastic Coating Corp. which will install manufacturing equipment in the near future.

PRICES

MARKET WOOD PULP

First Quarter Contract Prices Per Short Air-Dry Ton

	Delivered Basis		Varying Freight Allowances		
	U.S.	Canadian	Swedish	Finnish	Norwegian
Groundwood		‡$60.00/$95.00*	*$80.00/$85.00*	$80.00/ —	
Kraft, Bleached	140.00/147.50	145.00/155.00	$140.00/142.50§		$142.50/ —
Semi-bleached, Kraft	135.00/ —	130.00/135.00	$130.00/132.50§	130.00/135.00*	
Kraft, Unbl.	95.00/105.00	100.00/135.00	*105.00/110.00*	*105.00/135.00*	
Sulphite, Blchd.	140.00/ —	140.00/ —	$135.00/140.00*	140.00/ — *	$135.00/140.00*§
Sulphite, Unblchd.	120.00/ —	120.00/ —	$115.00/122.00*	120.00/125.00*	
Sulphite, Unbl. Gl'sn.		124.00/ —	*124.00/ —		
Soda, Blchd.	140.00/ —	140.00/ —			

‡ F.o.b. Shipping Point. § On Dock Atlantic Ports. * Freight allowed.

RAG MARKET

New Domestic Cotton Cuttings

Delivered Mill Basis

	Per 100 lbs.
No. 1 White Shirts	$11.25/$11.50
No. 1 Unblchd. Muslins	14.00/ 14.50
Blchd. & Unblchd. Underwears	14.00/ 15.00
Blchd. Canton Flannels	11.00/ 11.50
No. 1 Light Silesias	7.50/ 8.00
No. 1 Light Prints	6.00/ 6.50
No. 1 Blue Overalls	6.75/ 7.25
Suntan Khakis	6.00/ 6.50
Fancy Shirts	6.50/ 7.00
Mixed Khakis	3.50/ 4.00
Cottonades	3.75/ 4.25
No. 1 Washables	3.50/ 3.75

Old Domestic Cotton Rags

(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
Mixed White	$2.75/$3.00
Cotton Pants & Overalls	2.00/ 2.25
Thirds and Blues, Repacked	1.65/ 1.75
No. 2 Roofing Rags	.70/ .75

COTTON LINTERS

Memphis Market

F.o.b. Oilmills

	Jan. 12 Per 100 lbs.
Grade 1	n.a.
2	n.a. / $9.00
3 — 1st cut—felting	8.50/ 7.00
4	6.50/ 4.50
5	4.25/ 3.25
6 — * 2nd cut—chemical	3.00/ 3.00
7	3.00/ 3.00

* Based on 73% cellulose.

Bagging

(Prices to Dealers, F.o.b. N. Y.)

	Per 100 lbs.
Foreign Gunny	$4.00/$4.25
Foreign Scrap Burlap	3.00/ 3.75
Heavy Wool Tares	4.00/ 4.25
Austr. Wool Pouches	4.00/ 4.50
Domestic Manila Rope	6.50/ 7.00
Domestic No. 1 Sisal Strings	5.00/ 5.25

WASTE PAPER MARKET

Prices to mills, per ton, f.o.b. cars shipping point (includes brokers' fee.) These quotations are a partial indication of the price range or volume tonnage in each market on the date specified, as gathered from major dealers. SPECIAL PACKINGS AND SPOT TONNAGE NOT INCLUDED. Prices nominal. See TRENDS.

	New York Jan. 19	Boston Jan. 16	Chicago Jan. 5	Phila. Jan. 19
No. 1 Mixed Paper	$10.00/ 11.00	$10.00/ 11.00	$12.00/ —	$10.00/ 11.00
No. 1 News	12.00/ 13.00	12.00/ 14.00	17.00/ —	12.00/ 13.00
Overissue News	18.00/ 20.00	14.00/ 16.00	22.00/ —	18.00/ 20.00
Mill Wrappers	14.00/ 17.00	12.00/ 13.00	15.00/ —	14.00/ 17.00
Old Corrugated	16.00/ 18.00	15.00/ 16.00	20.00/ —	14.00/ 16.00
Double Kraft Ld. Corr. Cuts	35.00/ 47.50	37.50/ 47.50	45.00/ —	35.00/ 47.50
100% Kraft Corr. Cuts	55.00/ 60.00	50.00/ 60.00	60.00/ —	55.00/ 60.00
No. 1 Sorted Brown Kraft	35.00/ 40.00	35.00/ 45.00	25.00/ —	35.00/ 40.00
New Br. Kraft Env. Cuts	70.00/ 77.50	65.00/ 77.50	65.00/ —	65.00/ 75.00
New Br. Kraft Bag Waste	60.00/ 70.00	65.00/ 75.00	70.00/ —	60.00/ 65.00
No. 1 Gdwd. Shvs.	18.00/ 20.00	25.00/ 30.00	22.00/ —	20.00/ 25.00
White Newsblanks	60.00/ 70.00	50.00/ 60.00	40.00/ —	55.00/ 60.00
No. 1 Soft Wht. Shvs., coated	65.00/ 70.00	70.00/ 80.00	60.00/ —	60.00/ 70.00
Hd. Wht. Shvs.	95.00/105.00	95.00/110.00	85.00/ —	95.00/105.00
Hd. Wht. Env. Cuts	125.00/130.00	110.00/125.00	100.00/ —	125.00/130.00
Col. Tab. Cards	47.50/ 57.50	55.00/ 60.00	55.00/ —	50.00/ 55.00
Manila Tab. Cards, bales	75.00/ 80.00	75.00/ 85.00	70.00/ —	75.00/ 80.00
Mixed Ledger	40.00/ 45.00	40.00/ 50.00	50.00/ —	40.00/ 45.00
White Ledger	57.50/ 65.00	60.00/ 65.00	65.00/ —	60.00/ 70.00
No. 1 Book & Mag.†	18.00/ 20.00	18.00/ 22.50	15.00/ —	18.00/ —
No. 1 Rep'd. Hvy. Books‡	30.00/ —	25.00/ 35.00	30.00/ —	30.00/ —

† Includes Time & Life; no coarse groundwood. ‡ Not to exceed 10% groundwood. § Deld.

PRICES OF MATERIALS

Aluminum sulfate:
cml. bags, c.l. wks. cwt. $1.85 / —
iron-free, c.l. wks. cwt. 3.55 / —

Casein, acid prec.:
dom. sh. pt. c.l. lb. .27 / .37½
Arg. ex dock, duty paid. .21½/ .23
New Zeal. do. .25 / .26

Caustic soda:
c.l. wks. solid, 76% cwt. 3.70 / —
flak. & grd. 400-lb. drums, c.l. 4.10 / —
liquid 50% tanks 2.55
liquid 70% tanks 2.65

China clay:
dom. air-float, c.l. wks. ton 10.00
water-washed, lump, filler ton 11.00
coating ton 17.60 /30.50
imported, ex. whse. short ton 16.00 /29.50

Chlorine:
single-unit tanks, works cwt. 2.93 / —
multiple unit, 2-5 cars per yr. 3.83 / 5.00

Formaldehyde:
USP, inh. dms. c.l. wks. lb. .0666/ —
l.c.l., E. wks. lb. .071 / —

Lime:
hydrated bags, wks. tons 14.50 /15.50

Gum rosin:
K, M, N, drms, c.l. Savan, cwt. 7.67 / 7.70

Rosin size:
70%, gum & pale grds., tank cars, south, sh. pt. cwt. 6.60 / 6.65

Salt cake:
dom. bulk, c.l. wks. ton 19.00 / —

Soda ash:
light, 58%, bags, wks. cwt. 1.65
bulk cwt. 1.35

Sodium silicate, 40° Be.:
tank-cars, wks. cwt. 1.00 / —
drums, c.l. wks. cwt. 1.35 / —

42° Be. WW,
tank-cars, wks. cwt. 1.60 / —
drums, c.l. wks. cwt. 1.95 / —

Sodium peroxide:
dms. c.l. E. of Miss. lb. .186
l.c.l. do lb. .191 / .201

Soybean, protein:
chem. isol., wks. c.l. bags lb. .23 / .23½

Sulphuric acid:
60° Be. cbys. c.l. wks. cwt. 1.75 / 2.00
l.c.l. wks. cwt. 2.30 / 2.45
tank-cars, wks. ton 16.30 /18.60

Sulphur:
crude, c.l. mines, contract, long ton 25.50 /27.50
f.o.b. vessels Gulf do. 27.50 /30.50

Sulphur dioxide:
liquid, coml. cyl., wks. lb. .09
multi-unit cars lb. .0535

Starches:
corn, multiwalls, c.l. prod. plant:
pearl cwt. 6.39 / —
white, dextrines cwt. 7.78 / —
chlorinated cwt. 8.14 / —
potato, Idaho, c.l. wks. W. cwt. 6.50 / —
East, partial fr. all. net 6.00 / —
potato, Maine, f.o.b. wks. cwt. 5.75 / 6.00

Talc:
domestic, sacks, c.l. wks. ton 25.00 /30.00

Titanium dioxide:
anatase, c.l. deld. E. bags. lb. .22½/ .23
l.c.l. deld. lb. .23½/ .24
rutile, c.l. deld. lb. .24½/ .25
l.c.l. deld. lb. .25½/ .26

PAPER PEOPLE

(Continued from page 12)

Calif. Container Promotes Four

California Container Corp., a wholly owned subsidiary of Container Corp. of America, has appointed William P. Peters as general manager of the company's Northwest folding carton plants at Portland, Ore., and Seattle, Wash., with headquarters in Seattle.

Mr. Peters joined the California Container organization in 1947. In 1951 he was made plant manager at Portland and in 1953 he was appointed general manager of folding cartons at that plant. Eugene H. Thomas has been named sales manager of the company's Los Angeles shipping container division. Mr. Thomas has been with California Container Corp. since 1937 and has served as assistant sales manager of the Los Angeles container division since February, 1952.

Walter L. Sweeney has been promoted to assistant general manager of the company's Los Angeles shipping container operations. Mr. Sweeney has been a member of the organization at the Oakland, Calif., plant since 1945 with experience in both the corrugated container and folding carton divisions. Since March, 1953 he has served as general manager of folding cartons at Oakland.

Fred A. McFarland is now general manager of the company's folding carton operations in the San Francisco Bay area. Prior to this appointment McFarland held the positions of assistant sales manager for corrugated containers and general manager of folding cartons, respectively, at California Container's Seattle plant.

Fox River Promotes Three

The following promotions have been made in the sales department of Fox River Paper Corp., Appleton, Wis.

Arthur C. Austin, former eastern manager, has been named manager of converting sales. Henry C. Kruger, who formerly served as planning director, is now eastern manager. John S. Walworth has been advanced to midwest manager.

Gordon Murphy remains as western manager in the Hollywood office, Ralph Hayden is in charge of technical paper sales, and Charles H. Krueger is southern sales representative.

A. C. Austin

H. C. Kruger

J. S. Walworth

H&D Names Two Executives

Two executives have been appointed to key production posts in Hinde & Dauch Paper Co. of Canada, Ltd.

F. A. Dieckbrader was named as manager of pulp and paper mills, and Edward L. Lukemire becomes general superintendent of Toronto mills.

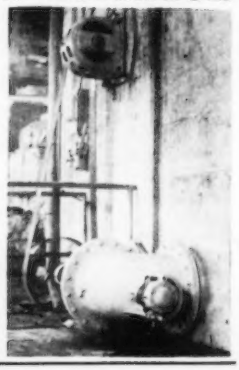
In his new position, Mr. Dieckbrader will have headquarters responsibility for production at two H & D mills at Toronto and one at Trenton, Ontario.

POWER SAVINGS with APMEW AGITATOR

Usually Repay Investment TWO TIMES *EVERY YEAR!*

Q— How?

A— By giving unique agitation for the more uniform consistency that assures BETTER, MORE SALABLE PAPER
Write us for effects valuable power savings



APMEW AGITATOR GIVING EXCELLENT AGITATION AND MIXING ON LARGE CHEST 40 FT. LONG BY 20 FT. WIDE BY 20 FT. DEEP

APMEW, INC., P. O. Box 1, Glens Falls, N.Y.

F. A. Dieckbrader

E. L. Lukemire

A native of Cincinnati, Mr. Dieckbrader has spent his life in the paper and boxboard industry. Working for various companies in the United States as a young man, he spent some time on every job in a paper mill.

He came to Canada in 1928 and joined H & D in 1932. In 1935, he became superintendent of H & D boxboard and linerboard mills, and in 1950, he was appointed general superintendent of mills, a position he held until his recent appointment.

Mr. Lukemire comes to Hinde & Dauch from Oco Water Systems, Inc., where he was vice-president and general manager. A native of Williamsburg, Ohio, he also is a veteran in the paper board and allied industries.

OBITUARIES

Herman Moses Gumbin, 58, president of the Rockford Paper Mills, Inc., Rockford, Ill., died January 3 in Miami Beach, Fla. He was a resident of Grand Rapids, Mich.

Fred Pontin, 63, Olympia, assistant general safety supervisor for Crown Zellerbach, Corp., lost his life on January 7 when his car took an unexplained plunge across a West Lion lot and down a 100-foot cliff.

John C. Van Cleaf, a former executive of the Gaylord Container Corp., Jersey City, died suddenly January 4 at his home, of a cerebral hemorrhage.

Mr. Van Cleaf entered the corrugated paper business upon graduation, working first for the Thompson Norris Co. in Brooklyn. He joined the Jersey City plant of Gaylord 20 years ago and became assistant general Eastern manager. He designed corrugated boxes, some of his designs being patented. He retired two years ago.

Alexander D. M. Martin, 61, district manager of the Hinde & Dauch Paper Co. box operations in Buffalo, N. Y., more than 20 years, died January 5 after a month's illness.

William A. Koch, 47, division sales manager for the Brown Paper and Pulp Co., died December 23 in Montclair, N. J. after a long illness.

Edward H. Frank, 62, vice-president of the Hudson Valley Paper Co., died on December 23.

Mr. Frank came with the company in 1922. He represented the company in Binghamton, Glens Falls, Burlington and other important printing centers. Previous to coming with Hudson Valley Paper Co. he had been with International Paper Co. and American Writing Paper Corp.

New Bolton Award Contest Announced

John W. Bolton & Sons, Inc., Lawrence, Mass. has announced the launching of the Seventh Bolton Award Contest. The subject of the contest is "The Obligation of an Employee to His Company."

This contest is to be held under the sponsorship of The American Pulp and Paper Mill Superintendents Assn. just as were the six previous contests. Following the policy set up in 1944, this contest is continuing to foster "an exchange of ideas on matters of common interest" to all persons engaged in the pulp and paper industry, and "to preserve them in permanent form" for free distribution within the industry.

Cash awards will cover thirteen prize-winning papers—three national winners (first, second, and third awards), and ten divisional winners. The cash awards total $3,250. The first award is for $1,000; the second, $750; and the third, $500. Each divisional award is for $100.

The contest is open to all employees of North American pulp and paper mills. It is not confined to membership of the Superintendents Association. Papers for the contest should be held to within 1,500 words. They should be typed (double spaced) on one side of 8½" x 11" sheets.

All entries should be mailed to the Secretary and Treasurer, The American Pulp and Paper Mill Superintendents Assn. 327 S. LaSalle street, Chicago 4, Ill. The deadline for postmarking them is midnight, March 31, 1954. All contest papers remain the property of John W. Bolton & Sons, Inc.

Get Wage Increases

Three Indiana locals of the Pulp, Sulphite and Paper Mill Workers have won wage increases in recently completed contract negotiations. The locals are Local 428, the Osborn Paper Co., Marion; 574, at the Lindley Division of Morris Paper Mills, Marion; and 182, at the Fort Wayne Corrugated Paper Co., Hartford City.

RECORD PAPER & PULP STOCK VALVES "BONNETLESS" SELF CLEARING - - - "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

"RECORD PRODUCTS EXTENSIVELY USED IN DEFENSE PROJECTS"

RECORD FOUNDRY & MACHINE COMPANY

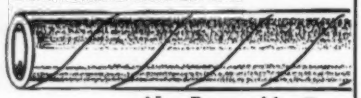
LIVERMORE FALLS, MAINE, U. S. A.

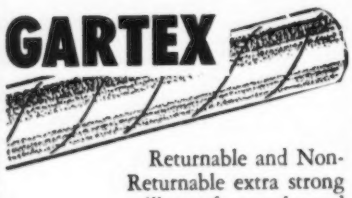
Montgomery to Address Miami Valley Supts.

A. E. Montgomery, J. O. Ross Engineering Corp., 201 N. Wells street, Chicago, Ill. is to address the January 26, 1954 dinner meeting of the Miami Valley Division of The American Pulp and Paper Mill Superintendents Assn. His subject will be Variation of Drying Rate of Individual Dryers Through the Dryer Section.

CHAS. T. MAIN, INC.
CONSULTING ENGINEERS
Process Studies, Design, Specifications and Engineering Supervision
PULP AND PAPER MILLS
Steam, Hydraulic and Electrical Engineering
Reports, Consultation and Valuations
80 Federal Street Boston 10, Mass.

THE RUST ENGINEERING CO.
PITTSBURGH 19, PA. • BIRMINGHAM 3, ALA.
Offices in Principal U.S. and Canadian Cities
Engineers Constructors
Complete Service for PULP and PAPER MILLS including all auxiliaries and byproducts.
Surveys • Reports • Design
Construction • Modernization

MERKOR

Non-Returnable, Durable standard mill core.

GARTEX

Returnable and Non-Returnable extra strong mill core for regular and special needs.

MADE TO YOUR SPECIFICATIONS
Write for samples and prices
MERCER
PAPER TUBE, INC.
655 WEST INGHAM AVE.
TRENTON, NEW JERSEY
Sales Offices:
NEW YORK OFFICE, 500 5TH AVE.
PHILA., PA., PHONE MARKET 7-3313
J. E. FRICKE CO.

NORTHERN EMPIRE TAPPIMEN — Guest speaker, Dr. Wilfrid Gallay (second from left) addressed the January meeting of the Northern District, Empire State Section, TAPPI. Dr. Gallay is technical director, E. B. Eddy Co., Ltd., Hull, Quebec. The meeting was held at the Black River Valley Club, Watertown, N. Y. With Dr. Gallay (L to R) Sheldon Young, district chairman-elect, Crown Zellerbach Corp.; Richard Murtaugh, district secretary, and James Parmele, district chairman, both of St. Regis Paper Co.; John Treadwell, district treasurer, Treadwell Supply Co.

Announce 3rd Albert Award Competition

The Executive Committee of the Delaware Valley Section of TAPPI has announced the third annual Albert Award competition.

Named for E. J. Albert, a founder, charter member and past Chairman of the section, this competition is sponsored to give the younger members of the industry an opportunity to gain experience and recognition.

The past two contests produced a number of excellent papers that formed the basis of two successful meetings.

Copy of the rules and qualifications may be had on request. The competition is not restricted to TAPPI or local section TAPPI members. If there are any questions please write or call Award Chairman, A. L. M. Bixler, Warren Mill, Riegel Paper Corp., Riegelsville, N. J.—telephone Warren Glen, N. J. 2-2136.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1953	Dec. 12 94.7	Dec. 19 95.3	Dec. 26 63.5	Jan. 2 '54 68.5r	Jan. 9 '54 94.4
1952	Dec. 13 93.8	Dec. 20 95.1	Dec. 27 62.1	Jan. 3 '53 82.8	Jan. 10 '53 95.2

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1952	97.1	97.8	95.1	90.4	87.9	87.6	73.3	86.1	81.7	90.7	90.5	85.3	88.6
1953	94.5	94.6	94 4	92.7	93.9	93.8	82.6‡	95.2‡	93.7‡	97.4‡	95.0‡	84.2‡	92.8‡

COMPARATIVE YEARLY SUMMARIES

	1946	1947	1948	1949	1950	1951	1952	1953
Year to Date Year Average	96.9	101.7	92.1	83.7	95.8	98.0	88.6	92.8

‡ Preliminary.
r Revised.

PAPERBOARD OPERATING RATIOS†

1953	Dec. 12 94	Dec. 19 93	Dec. 26 77	Jan. 2 '54 43	Jan. 9 '54 78
1952	Dec. 13 97	Dec. 20 96	Dec. 27 n.a.	Dec. 31 66	Jan. 10 '53 83

n.a.—Not available.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1952	81	86	85	82	82	82	71	89	88	96	96	85	85
1953	91	95	95	95	96	93	81	98	94	97	94	79	93

All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

Note: In the above tables *all* the ratios shown are on the basis of a normal 6 and 7 day capacity.

† Per cents of operation based on "Inch-Hours" reported on a 6-day basis to the National Paperboard Association.

PAPER TRADE JOURNAL CLEARING HOUSE PAPER TRADE JOURNAL

RATES FOR ADVERTISING (PAYABLE IN ADVANCE)

$.75 cents per line (6 words to line) minimum charge $3.75
—Additional charge of 70 cents if box number is used

Situation wanted advertisements can be repeated for ½ rate

Space in this section can also be purchased at $5.00 per column inch—(1" x 2¼")

Address replies to advertisements appearing under Box Number in care of **PAPER TRADE JOURNAL, 15 West 47th Street, New York 36, N. Y.**

HELP WANTED

CONFIDENTIAL EMPLOYMENT SERVICE

For paper mills, pulp mills and paper converting plants. Servicing employers seeking executives and executives seeking positions. WE WELCOME YOUR INQUIRIES.

CHARLES P. RAYMOND SERVICE, Inc.
Phone: Liberty 2-6547
294 Washington St., Boston 8, Mass.

J-22

LAMINATED BOARD SALESMAN

Long-established board mill located in southeast requires experienced man to market production from recently installed laminator. Should have thorough knowledge of kraft and chip laminated grades. This is an opportunity with a company having excellent reputation and sound personnel policies. Confidences strictly respected. Address Box 54-8 care Paper Trade Journal.

J-29

POSITION OPEN
MULTI PLANT OPERATION
MANUFACTURING LIGHT WEIGHT SPECIALTY GRADE PAPERS

Requires man experienced in technical phases of paper testing and development to assume responsibilities of Plant Chemist.
Must supervise laboratory personnel. Initiate development projects, maintain customer and vendor contacts, assume responsibility for all laboratory testing equipment and supplies and coordinate technical activities between mills. Excellent opportunity available for advancement. Salary commensurate with ability.

Address Box 54-13 care Paper Trade Journal.

J-22

PERSONNEL SERVICE ASSOCIATES
115 State St., Springfield 3, Mass.
Tel. 6-4749

Confidential Placement Service for the Pulp, Paper and Converting industries. Administrative—Production—Sales—Technical. Attractive positions and competent men always listed. Inquiries welcome.

J-22

ASSISTANT PLANT MANAGER—National converter flexible packaging field—for one of eastern plants. Outstanding opportunity for experienced man. Broad knowledge of printing and bag making equipment and processes. Submit complete resume of experience and background. Address Box 53-499 care Paper Trade Journal. TF

WANTED

Paper Technologist or Chemist who is familiar with the manufacture of specialty grades. The man we are looking for is one whose present position and responsibilities involve product development, control of quality, control of laboratory tests, and customer vendor contracts.

This is an opportunity which is bounded only by the initiative and imagination of the individual. The physical plant facilities are both modest and adequate for the present line. New equipment will be added and changes will be made as new lines are developed. Present production is below 100 tons/day and no pulp mill is involved or contemplated. Compensation will be adjusted to your complete satisfaction. Midwest location.

Your reply will be held in the strictest confidence. In writing, please make your resume as complete and detailed as possible and enclose a recent photograph. Address your reply to Box 54-23 c/o PAPER TRADE JOURNAL.

F-6

WANTED
IMMEDIATE OPENING

First class adjuster for Pot-Devin Self opening bag machine. Excellent opportunity for advancement in expanding paper converting company. Location Southeast. Write 54-29, care Paper Trade Journal.

J-29

WANTED

TOUR FOREMAN—Age 40-50, having experience in running specialty grades on Fourdrinier.

Experience should cover various furnishes and should include groundwood.

This is a progressive, one-machine mill and the man we are looking for must be well trained and a good supervisor.

Please provide all personnel data, as well as a resume of past experience. A recent snapshot will be appreciated. Midwest location. Your reply will be held in strict confidence. Write Box No. 54-24 c/o Paper Trade Journal.

F-6

"Wanted — Chief Engineer"

We are seeking a man capable of efficiently producing and using steam. If you are that man, write us giving age; detailed resume of experience; and salary desired. Box 54-31 care Paper Trade Journal.

F-5

SUPERINTENDENT — Small mill making folding box board in New England. Please state previous experience and qualifications. Address Box 54-20 care Paper Trade Journal. F-5

MASTER MECHANIC WANTED

For parer mill. Should have supervisory ability and be competent to take charge of maintenance and electrical work. New Jersey Second Class Engineers License required, or ability to obtain same. He will have charge of 10 men in his department. Address in confidence, or phone CHARLES P. RAYMOND SERVICE, INC., 294 Washington St., Boston 8, Mass.—Telephone Liberty 2-6547.

J-29

SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. BIXBY, INC. 663 Brisbane Bldg., Buffalo 3, N. Y.

J-22

WANTED—Fine Paper Salesmen in Chicago who can earn top income selling for paper merchant. Drawing account and commission. Write for interview. Address Box 54-4 care Paper Trade Journal. J-29

WANTED—Quality Control Engineer to install and supervise quality control group in corrugated box division of Midwestern Plant. Young man with experience in both quality control and production preferred. Address Box 53-354 care Paper Trade Journal. TF

SALES ENGINEERS—Old and established manufacturer of pulp and paper machinery and stock preparation equipment in the East, desires to add sales engineers to expanding, aggressive sales department. Send complete data and small snapshot with application to Box 54-10 care Paper Trade Journal. J-29

WANTED—Top notch Production Man as assistant to busy manufacturing manager of progressive multi-plant tissue company integrated from pulp to converted products. Please include full information first resume. Excellent salary and future for right man. Address Box 54-18 care Paper Trade Journal. J-29

(2 MACHINE TENDER TOUR BOSS) One week vacation; one week sick leave. Cylinder men only. Salary $4680. per year. All replies held strictly confidential. Please give full details to Box 54-25 care Paper Trade Journal. F-12

WANTED—Plant Manager with ability to direct the activities of electrical and mechanical maintenance, power plant and plant engineering, in a medium sized paper mill located in the metropolitan area. Reply, giving entire personal history and experience to Box 54-27 care Paper Trade Journal. J-22

WANTED—Printer with experience in the printing and manufacture of polyethylene and pliofilm bags and other heat sealable transparent materials. Experience necessary. Send full particulars to Box 54-30 care Paper Trade Journal. J-22

SITUATIONS WANTED

PLANT MANAGER—Paper and Board and their conversion. Highly successful record in organization; administration; development; labor relations; and high level production. Presently employed. Seeks challenging opportunity. Address Box 54-12 care Paper Trade Journal. J-29

SITUATIONS WANTED

SALES EXECUTIVE seeks connection at staff level. Twenty years sales and management experience with Mill and dual Merchant. New England resident aged 45. Will relocate but prefer northeastern U. S. Box 54-16 care Paper Trade Journal. J-29

MASTER MECHANIC—25 years experience as master mechanic, 2 years experience as plant engineer in maintenance and construction. Age 47. Address Box 54-6 care Paper Trade Journal. J-29

GENERAL SUPERINTENDENT or Superintendent. Age 43. Desires to make change. 22 years experience in paper mills on cylinder and Fourdrinier machines, in all phases of papermaking on towels, napkins, toilet tissue, wet strength, colors, facial—also extensive knowledge in de-inking. Would consider a salesman position with a company selling wire or felts. Address Box 54-26 care Paper Trade Journal. F-6

FOR SALE

FOR SALE

110" Hamblet Sheeter.
60" Finlay Sheeter.
40" Clark Single Sheeter.
48" Kidder model CH Slitter.
28" Hobbs shear cut Slitter.

BACK-STANDS, ANY SIZE, MADE TO ORDER

Thomas W. Hall Company, Inc.
120 West 42nd St., New York 36
(Plant at Stamford, Conn.) TF

ASSISTANT PLANT MANAGER—23 years thorough knowledge and experience in paper making plus lithograph offset printing. Age 42, formerly backtender and pressman. Seeks challenging position. Address Box 54-32 care Paper Trade Journal. J-29

FOR SALE

FOR SALE

1—11 Roll, 114" Machine Calender Stack, bottom roll 22" dia., 2 rolls 15" dia., 8 intermediate rolls 10" dia. complete with bronze-lined water-cooled bearings, doctors, heavy box frames, mechanism for weighting, and drive. All in excellent condition ready for immediate shipment. Drawings on request.

OSBORNE PAPER MILL EQUIPMENT CORP.
FULTON, N. Y. **Tel. 2-4254**
J-29

FOR SALE

72—Beloit Dryers, 42" dia. x 118" face, approved for 50 p.s.i. Dryers are complete with bearings, gears, Johnson Joints, intermediate gears, and some Stands.

Please address all inquiries to: — Box 53-482 care Paper Trade Journal.

J-22

FOR SALE

FOR SALE—80" Creper and Waxer complete with Steam Plant. All new equipment. Address Box 53-293 care Paper Trade Journal. TF

PAPER COATING MACHINERY MANUFACTURERS — Waxing, Oiling, Carbon Laboratory Coating and Treating and Flat Ream Measuring and Converting Machines. New improvement. THE MAYER MACHINE COMPANY, INC., 1313 Buffalo Road, Rochester, 11, N. Y. TF

FOR SALE—two 36# Beck Sheeters with G & E electric eyes. Excellent condition. STANDARD GREETINGS, INC., 191 Appleton St., Holyoke, Mass. J-22

WANTED

WANTED

"Paper Board Converter requires for new addition to its plant 60"-70" Heavy Duty Duplex Sheeter. Also several 36"-48" Single Knife Sheeters. Two 36"-48" Slitters and Rewinders. Supply complete information as to age, condition, price, etc. Box 54-1, care Paper Trade Journal. J-22

WANTED—Good, used stock pump, 3000 to 5000 gallon capacity at 70 to 80 foot head. When offering, give complete information and specifications. Write Box 53-484 care Paper Trade Journal. F-19

WANTED—10 Dryers 36 x 84—50 lbs. 3½" x 111 Tooth Gears 2 Rt angle enclosed Drives Approx 6:1—25 HP 1 Ditto—100 HP. Reply to Gardiner Paper Mills, Inc., Gardiner, Maine. J-29

WANTED—Mechanical Saveall, Bird 6-A or equivalent, latest type, also one 72" Sheeter with lay boy. Address Box 54-28 care Paper Trade Journal. F-12

FOR SALE—IMMEDIATE DELIVERY

86" BELOIT FOURDRINIER PAPER MACHINE

INSPECT ON ORIGINAL FOUNDATION

FOURDRINIER SECTION—Anti-friction bearing equipped

Stainless steel headbox and Valley Voith inlet
Wire—86½" width x 50' length
Breast Roll—18" dia. x 90" face—Timken bearings
28 Bronze Table Rolls 3½" dia. x 88¼" face—Fafnir ball bearings
4 Wire Return Rolls 6" dia. x 90" face
1 Nash Wire Guide—Palm Type with 1 Wire Guide Roll 6" dia. x 90" face
1 Set of Stainless Steel Save-all Pans 88" long
5 Brass Suction Boxes with #3 Nash Hytor Vacuum Pump and 15 H.P. motor
Suction Couch Roll—18" dia. x 90½" drilled face with #7 Nash Vacuum Pump and 40 H.P. motor
Beloit Adjustable Shake with 15 H.P. motor

PRESS SECTIONS—All Bearings are Water Cooled

#1 Press—Top Roll—Stonite 20¼" dia. x 88" face
Bottom Roll—Rubber 16" dia. x 85⅜" face
#2 Press—Top Roll—Brass 15" dia. x 88" face
Bottom Roll—Rubber 16" dia. x 85⅜" face
#3 Press—(Plastisizing)—Top Roll—Rubber 15¾" dia. x 84" face
Bottom Roll—Brass 15" dia. x 84" face

1ST DRYER SECTION

18 Paper Dryers 42" dia. x 84" face, complete with two-deck frames, gears, bearings, Johnson Steam Joints, Doctors on Top and Bottom Dryers, 50# steam pressure.
6 Felt Dryers 36" dia. x 84" face, complete as above.
53 Felt Rolls for top and boitom felts.
2 Hand Guides.
2 Automatic Guides.

SIZE PRESS (BELOIT)

Top Roll—Brass 17¾" dia. x 83" face—anti-friction bearings
Bottom Roll—Rubber 18" dia. x 83" face—water cooled bearings

2ND DRYER SECTION

7 Paper Dryers 42" dia. x 84" face, complete with two-deck frames, gears, bearings, Johnson Steam Joints, Doctors on top and bottom dryers, 50# steam pressure.
22 Felt Rolls for top and bottom felts.

CALENDAR STACK

Beloit 7 Roll—Face of Rolls 82". Bottom Roll 16" dia. Top Roll 14" dia. 7 Intermediate Rolls 8" dia.

REEL

Beloit Two Bowl Reel—Bowls 15" dia. x 91" face

REWINDER

Warren Two Drum—87" face—With 4 Sets of Shear Cut Slitters

DRIVES

Terry Steam Turbine, New in 1948. Rated at 125 H.P., 150# pressure with 10# back pressure. Provision has been made in Turbine and Gear to increase to 165 H.P., 150# pressure with 50# back pressure without any alteration to the turbine. Turbine is direct connected to Link Belt Silent Chain Drive connected to line shaft of machine. Line Shaft is driven by Terry Steam Turbine through Falk Drive, which drives the machine drive pulleys which are equipped with Cutler-Hammer electric magnetic clutches for individual speed control on each drive. Entire Drive is interlocking to Turbine.

PUMPS

All water and stock pumps complete with motors and controls are included.
All pumps are direct connected to motors.

PIPING

All piping is included with the machine and is of stainless steel and copper construction.

CONDENSATE SYSTEM

Complete condensate system for dryer steam returns are included. This machine will trim 75" and operated at speeds up to 450 f.p.m.

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET **NEWARK 4, N. J.**

TELEPHONE HUMBOLDT 2-2177

J-22

1—Sandusky Suction Press, 162" drilled face x 22" diameter with roller bearings.

BARKING DRUM
1—10' x 30'.

BEATERS
2—1500 lb. Dilts iron tub beaters, rolls 52" diameter x 42" face.
1—Noble & Wood Beater roll and stand, 70" diameter x 44" face.
Write us regarding your requirements.

BREAKER STACK
1—110" face 2 roll breaker stack, with frames.

CALENDER STACKS
1—4 roll 72" Calender Stack. (Extra heavy duty).
1—3 roll 60" Friction Calender Stack, Two iron rolls and 1 Paper or Cotton Roll.
1—6 Roll 86".
1—5 Roll 90".
1—11 roll 114" Calender Stack.
1—2 roll 116" Calender Stack.

CHIPPERS
1—88" Carthage 4 knife Chipper.
1—96" Murray 4 knife Chipper—anti-friction bearings.
1—84" Carthage 4 knife Chipper.

CLASSIFINER
1—Dilts Classifiner, practically new, with motor.

CORE MACHINES
1—Dietz Core Machine (Tube Winder).

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.

CYLINDER MOULDS
2—30" diameter x 72" face.
1—30" diameter x 92" face.
2—36" diameter x 54" face.
2—36" diameter x 84" face.
2—36" diameter x 86" face, with vats.
6—36" diameter x 110" face, with 24" diameter face couch rolls.
1—48" diameter x 117" face.
2—36" diameter x 136" face with anti-friction bearings.

DIGESTERS
2—14' Globe Rotary Digesters.

DRIVES
1—Jones Reducer 75 h.p.—30.8 to 1.
1—Jones 21—H.P., ratio 10 to 1.
1—#4 Reeves Drive.
1—Vaughn 100 H.P. enclosed drive Ratio 7 to 1.
2—Cleveland agitator drives, for chests.

DRYERS
1—Complete unit, consisting of 6 dryers, 36" diameter x 38" face, including frames, gears, anti-friction bearings.
1—48" diameter x 70" face.
2—Dryers 48" diameter x 134" face.
1—28" diameter x 48" face.
1—36" diameter x 67" face.
2—36" diameter x 120" face.
1—48" diameter x 144" face.
5—28" diameter x 80" face with anti-friction bearings.
3—36" diameter x 72" face.
3—60" diameter x 86" face.
1—48" diameter x 100" face.
1—48" diameter x 106" face.
1—36" diameter x 90" face.
8—24" diameter x 60" face. With frames, gears, anti-friction bearings.
8—36" diameter x 44" face.
5—24" diameter x 54" face, with bearings.
2—48" diameter x 54" face.
20—36" diameter x 84" face, complete.
10—48" diameter x 88" face. Frames, gears, bearings and felt equipment.
6—36" diameter x 76" face.

EMBOSSING CALENDER
1—15" 2 roll embosser.

EXTRACTOR ROLL
1—Extractor roll, 26" diameter x 104" face, with rubber couch roll.

FELT GUIDES
2—Gilbert & Nash Felt Guides.

FLAT SCREENS
2—12 plate Flat Screens.
2—14 plate Packer, roller shoes.

GEARS
Write us regarding your requirements.

GRINDERS
2—4 pocket Grinders.
2—3 pocket Grinders.

HEAD BOX & INLET
1—Valley Iron Works Inlet complete with head box, 156", all stainless steel.

HYDRAFINER
1—Dilts Hydrafiner with motor.

JORDANS
2—Noble & Wood Mammoth.
1—#2 Emerson anti-friction bearing.
1—#1 Emerson, iron plug, new spare filling.

LABORATORY EQUIPMENT
Write us regarding your requirements.

LAMINATING MACHINE
1—72" Hudson Sharp laminating machine, reverse coater, with overhead crane.

MOTORS
1—150 H.P. Westinghouse 495 R.P.M. 3/60/440, with starter.
Write us regarding your requirements.

PRESSES
Write us regarding your requirements.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper.

PUMPS
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

RAG CUTTERS
2—#20 Taylor Stiles, complete with anti-friction bearings.

REELS
1—86" 2 bowl reel.
1—84" 3 bowl revolving reel.
1—123"—3 bowl revolving reel.
1—134"—2 drum.
1—72" Downingtown Reel, 2 bowl.

REFINERS
1—12" Wiener Fefiner.

ROLL HEADING MACHINE
1—Montague header, with air cylinders, heating element, etc., for up to 36" diameter by 82" long roll.

ROLLS
1—Rubber Couch Roll—20" diameter x 108" face.
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)
5—Rubber Couch Rolls—24" diameter x 110" face.

ROTARY SCREENS
Write us regarding your requirements.

SAVEALLS
4—Thompson Washers 36" x 110" cylinder, molds, 24" diameter rubber couch rolls.
2—Savealls 36" diameter x 136" face, hollow shaft cylinder molds, anti-friction bearings, iron end vats. Very good condition.
2—Pusey & Jones Savealls, 42" x 146" cylinder molds, iron end vat, anti-friction bearings & rubber couch rolls.
2—Sandy Hill, 36" diameter x 86" face cylinder molds, anti-friction bearings and couch rolls.

SHAKER ROLLS
1—134" face x 14" diameter with Messenger bearings.
1—104" face x 14" diameter with Messenger bearings.

SHEETERS
1— 82" Hamblet.
1—100" Moore & White "Simplex" with layboy.
1— 72" Hamblet Sheeter.
1—140" Hamblet (Simplex).
1—140" Hamblet (Duplex).
1— 62" Moore & White Sheeter, layboy, 16 roll back stand.

SHOWERS
5—Bird showers 96" face.

SHREDDER
1—#5 Taylor Stiles "Giant" Pulp Shredder.

SLITTERS & WINDERS
1—26" Cameron—Type 10.
1—42" Cameron—Type 6.
1—52" Cameron—Type 10, with variable speed motor.
1—62" Cameron—Type 10.
1—62" Cameron—Type 40-1-AF.
3—72" Cameron—Type 10.
1—104" Beloit two drum winder.
1—118" Beloit 2 drum winder.
2— 84" 4 drum Moore & White.
1—120" Moore & White, 4 drum winder.
1—108" Sandy Hill winder.
2— 86" Two Drum Moore & White, 50" diameter rewind.

STOCK PUMPS
1— 8 x 18 Shartle Duplex.
2—10 x 10 Beloit Duplex, low type.
1— 8 x 18 Shartle Triplex.
2—10 x 20 Shartle Triplex.
Advise as to your requirements.

SUCTION BOX CONDITIONER
12" capacity with 5 H.P. motor.

SUCTION BOXES
Write us concerning your requirements.

SUCTION PRESS ROLLS
1—Sandusky Suction Press Roll 130" drilled face x 14⅞" diameter.

TABLE ROLLS
Write us regarding your requirements.
30—Table Rolls, bronze, 5" diameter x 148" face.

THICKENERS
1—Sandy Hill Thickener, all Stainless Steel, mold 60" x 101" face, with couch roll. Anti-friction bearings throughout.
1—Pulp Thickener, cylinder mold 48" x 117", with spare cylinder mold.

TOILET WINDERS
2—72" Hudson-Sharp (Surface type winder).
4—81" Dietz.

TRIMMERS
1—44" Seybold.
1—60" Guillotine cutter.

VACUUM PUMP
1—#8 Nash Hytor.
1—#9 Nash Hytor.
1—N-82 Nash, for Fulton-Midwest System
1—#6 Nash Hytor "Bronze."
1—#4 Nash Hytor Vacuum Pump.

WET MACHINE
1—72" Wet Machine.

YANKEE DRYERS
1—106" x 72" diameter.

Paddy Ross, Pres. **J. J. ROSS COMPANY** **Ben Kurs, Treas.**

377 Frelinghuysen Ave.* **Tel.—Bigelow 3-3720** **Newark 5, N. J.**

SALES REPRESENTATIVE

SALES REPRESENTATIVE: Experienced in selling Resin Coated and Printed Paper. Knowledge of specialty bags helpful. Age 30 to 45. Progressive company—opportunity for advancement. Salary open—liberal management benefits. Send complete resume with recent snapshot to Box 53-423 care Paper Trade Journal. TF

BUY

★ ★

U. S. DEFENSE BONDS

FOR SALE

We have over $500,000.00 worth of good, used equipment and we believe this is the largest inventory of used paper mill equipment available and the largest shop devoted exclusively to rebuilding paper mill machinery.

We also have approximately 50 experienced employees working 48 hours per week to help serve you. The following gives you an idea of the choice of available equipment we can offer you from stock.

1—134" Fourdrinier, Suction Press 42" dia. Dryers, Calender Stack, Pope Type Reel, 2-Drum Winder, Drives.

1—88" Fourdrinier Machine Voith Inlet, Suction Couch Suction Press, Straight-Away Press, Reversing Press, 34 Dryers, 26 ahead of Size Press, 8 after Size Press, Calender Stack, Pope Type Reel, Winder and complete Drive.

1—84" Bagley & Sewall Paper Machine with pick-up Felt, 8 Dryers 48" x 84", also baby dryer, top and bottom dryer felt equipment, 8-Roll Calender Stack, new rolls with Vickery Doctors, Pope Type Reel, Cameron Winder, complete drive also all auxiliaries to make complete mill.

1—Beloit 76" Machine same design and equipment as above.

1—72" Five-Cylinder Machine, 2-Main and 2 Primary Presses, 24 Dryers, 7-Roll Calender Stack, Vertical Reels, 2-Drum Winder.

1—54" Three Cylinder Machine, 2 Presses, 24 Dryers, Calender Stack, Reel Winder, Drives.

1—50" Fourdrinier with two Presses, Dryers, 48" dia. 46" face, Calender Stack, Reels and Winder.
Would make excellent experimental machine.

Dryers

9—42" dia., 132" face
6—42" dia., 124" face
6—48" dia., 118" face
1—48" dia., 94" face
8—48" dia., 84" face
2—48" dia., 104" face
11—36" dia., 48" face
46—48" dia., 46" face
12—Misc. odd face lengths

Calender Stacks

1—9-Roll, 114" face
1—7-Roll, 86" face
1—8-Roll, 82" face
1—8-Roll, 72" face
1—7-Roll, 72" face
1—3-Roll, 64" face
1—12-Roll, 84" face, Super

Winders

1—94" Beloit 2-Drum with ball-bearing through out, last run at 2350' per minute.
1—124" Moore & White 4-drum with slitters.
1—102" Moore & White.
4—Drum with slitters.
1—118" Beloit Slitters and Winder, anti-friction bearing equipped, 12 new top and bottom slitters, variable speed electric drive. Will run 2000 F.P.M., make 50" dia. rolls.
1—106" Langston Slitter & Winder, anti-friction bearings, rebuilt to make 60" dia. rolls. Will run 2000 F.P.M.
1—86" Langston, two drum with backstands, fully rebuilt, will make 50" dia. rolls, designed for 12 to 1500 F.P.M.
1—86" Johnstone Score-cut new in 1949, used less than one year, anti-friction bearings.
1—108" Pusey & Jones 2-drum Slitter & Winder, anti-friction bearings designed for 44" dia. rolls.
1—72" Bagley & Sewall Warren type Slitter & Winder.
1—84" Cameron Type 10 Model A, Serial No. 23816.

Reels

1—Heavy Black-Clawson 2-spool boxboard Reel, designed to make 60" dia. rolls. Will make width to fit your machine.
1—94" Pope Type Continuous Reel with 48" dia. drum, will make rolls up to 72" dia.
1—84" Bagley & Sewall Pope type Reel 36" dia. drum, will make rolls 50" dia.
1—Set 108" Bagley & Sewall two-spool Upright Reels.
1—Set 76" Black-Clawson 2-spool Upright Reels.

Sheet Cutters & Trimmers

1—76" Dayton Seybold Paper Trimmer.
1—56" Oswego Paper Trimmer.
1—48" Oswego Paper Trimmer.
1—46" Twentieth Century Paper Trimmer.
1—44" Oswego Paper Trimmer.
1—76" Hamblet Sheet Cutter with 24 roll backstands, Motor drive, Brannan folder.
1—82" Dillon Sheet Cutter with or without backstands.
1—106" Clark Aiken Sheet cutter.

Beaters

1—Dilts Breaker Beater, bandless roll 72" dia., 60" face, cast iron tub 35' long, 3000# capacity. Used very little.
2—Dilts New Type 1500# Beaters, cast iron tubs, rolls 56" dia., 48" face.
2—Dilts 1500# C. I. tub Beaters, rolls 62" dia. 54" face.
2—E. D. Jones High Speed Beaters, C. I. tubs, 2000# capacity, rolls 67" dia., 60" face.
2—Valley Iron Works High Speed Beaters, 1500# capacity, C. I. tubs, rolls 56" dia., 48" face. New in 1938. Many others designed to fit your needs.

Jordans

1—Dillon No. 1 with new set stainless plug & shell fillings.
1—Noble & Wood Pony Monarch with anti-friction bearings, extra set new fillings, pin-type couplings, 100 H.P. Synchronous motor & starting equipment.
1—Appleton No. 1, refillable plug, pin type coupling for direct connecting.
3—Noble & Wood Pony jordans, Belt drive, fillings to suit.
1—Black-Clawson Stubby Type Pony Jordan.
3—Noble & Wood Monarch Jordans, Belt driven, fillings to suit.
6—Nash Vacuum Pumps, size 1-5L.

Stock Pumps

1—8 x 20" Beloit Triplex Plunger Stock Pump.
2—8 x 18" Shartle Triplex.
2—8 x 18" Shartle Duplex.
1—8 x 12" Seneca Falls Triplex.
4—6 x 12" Moore & White Duplex.
1—8 x 10" Deane Triplex.
7—Warren S.O.B. Centrifugal.
4—Sandy Hill, 8" inlet, 6" outlet.
2—Frederick, 12" inlet, 8" outlet.
50—Various makes and sizes, some with motors.

Brass Fourdrinier Felt Rolls

40—5" dia., 148" face.
30—4½" dia., 148" face.
30—4" dia., 88" face
24—3" dia., 84" face (New)
20—6¾" dia., 96" face (New)
12—7" dia., 120" face (New)
Will shorten these to fit your machine.

Brass Covered Press Rolls

1—17½" dia., 108" face.
1—18" dia., 150" face.
4—18" dia., 86" face.
1—19½" dia., 99" face, stonite.
1—18" dia., 96" face, stonite.
2—18" dia., 84" face.
Many others, all sizes.

R. C. Press Rolls

1—28" dia., 148" face, 1" new rubber.
2—18" dia., 148" face, ⅝" rubber.
2—18" dia., 132" face, ⅝" rubber.
2—20" dia., 72" face, ¾" rubber.
3—17½" dia., 77" face, ¾" rubber.
Over 200 others from 56" to 172", 14" dia. to 20", journals to fit your bearings.

Drives

5—Beloit Double Reduction Angle Drives with Ryertex Bevel Pinion Gears, machine cut bull gears, 4½ to 1 ratio.
1—50 H.P. Falk, 17.3 to 1, enclosed straight-through type.
6—New Philadelphia Gear Works Angle Drives, single and double reduction, 20 to 40 H.P. about 4.13 to 1 ratio.

Miscellaneous

5—New Felt Stretches 48" and 60" long with 1 7/16" bronze screws, anti-friction bearings.
1—8' dia., 10" deep, 5/16" steel welded Chest with enclosed gear driven agitator.
1—72" Hanchet Knife Grinder.
1—48" Hanchet Knife Grinder.
3—Shartle Agiflow Combination Pumps & Agitator anti-friction bearings, bronze impellers.
1—48" Carthage Chipper.
20—8 to 14 plate Packer Screens, some with roller shoes.
2—No. 2-A Bird Screens, copper vats.
2—No. 2 Bird Screens, copper vats.
7—42" x 150" Hollow Shaft Cylinder Moulds.
1—36 x 134" Hollow Shaft Cylinder Moulds.
10—R. C. Couch Rolls from 12" to 24" dia., 72" to 124" face, good rubber.
80—11½ x 43" New or Rolled and Recut Screen Plates, cut .012 to .032.
2—Sets New Screen plates for No. 2 or 2-A Bird Screen, cut .10.
60—Motors all 220/440 volt 3 phase, 60 cycle, 5 H.P. to 100 H.P. Full details on request.
1—80" Black-Clawson Creping machine with expansion reels and winder.

The above is representative of our stock, however we have many items not listed. We can recondition every piece of equipment available and will guarantee you will be satisfied if you deal with,

OSBORNE PAPER MILL EQUIPMENT CORP.

FULTON, N. Y. **Tel. 2-4254**

WHERE TO BUY

Products listed in this section are those submitted by our advertisers.

ABRASIVES
Norton Co.
Simonds Abrasive Co.

ADHESIVES
American Cyanamid Company, Plastics & Resins Division
Borden Company
Diamond Alkali Co.
The Dow Chemical Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company
Monsanto Chemical Co.
National Starch Products, Inc.
Nopco Chemical Co.
Rohm & Haas Company

ADJUSTABLE SHAKE
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
Sandy Hill Iron & Brass Works

ADJUSTABLE SPEED DRIVE
Reliance Elec. & Engrg. Co.

AGITATORS
Apmew, Inc.
Appleton Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Improved Machinery Inc.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
D. J. Murray Mfg. Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.
Shartle Brothers Machine Co.

ANTHRAFILT
Anthracite Equipt. Corp.
Palmer Filter Equipt. Co.

ANTIFOAM
American Cyanamid Company, Industrial Chemicals Division
Hercules Powder Co., Inc.
National Aluminate Corp.
Nopco Chemical Co.

APRON CLOTH
Williams-Gray Co.

ARBORS, CORE
Bird Machine Company

BAG MACHINES
Dilts Machine Works
Heinrich, H. H., Co.
Potdevin Machine Co.
H. G. Weber & Co., Inc.

BALL MILLS
F. L. Smidth & Co.

BARK BURNER
Nichols Engrg. & Research Corp.

BARKERS AND CHIPPERS
Appleton Machine Co.
Carthage Machine Co.
Improved Machinery Inc.
D. J. Murray Mfg. Co.
Newport News Shipbldg. & Dry Dock Co.
Sandy Hill Iron & Brass Works
Valley Iron Works Co.

BARS
John W. Bolton & Sons, Inc.
Dilts Machine Works
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BASIC WEIGHT SCALES
Testing Machines, Inc.
Thwing-Albert Instrument Co.

BEARINGS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
B. F. Goodrich Co.
E. D. Jones & Sons Co.
Link Belt Co.
Magnus Metal Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Timken Roller Bearing Co.
The Torrington Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

BEATERS AND JORDANS
Apmew, Inc.
The Appleton Machine Co.
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
J. J. Ross Company
Ross Paper Machy. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

BEATER FILLINGS
John W. Bolton & Sons, Inc.

BED PLATES
Bahr Brothers Mfg. Co.
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
E. D. Jones & Sons Co.
Lukenweld Div., Lukens Steel Co.
Midwest Fulton Mch. Co.
Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

BELTING
Goodrich, B. F., Co.
The Goodyear Tire & Rubber Company
Link Belt Co.
U. S. Rubber Co.

BLEACHING AGENTS
Antara Chemicals Division, General Dyestuffs Corp.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
E. I. du Pont de Nemours & Co., Inc.
Rohm & Haas Company
Virginia Smelting Co.

BLEACHING APPARATUS
Improved Machinery Inc.
Jackson & Church Co.
E. D. Jones & Sons Co.
Perkins & Sons, Inc., B. F.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

BLOW PIPES & PITS
Carthage Machine Co.
Moore & White Co.
Murray Mfg. Co., D. J.
Walworth Company

BLOWERS
Buffalo Pumps, Inc.
Elliott Company, Inc.
Roots-Connersville

BOARD MACHINES
Black Clawson Company
Downingtown Mfg. Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

BOILERS
Babcock & Wilcox Co.
James Leffel Co.

BOXBOARD SCALES
Testing Machines, Inc.
Thwing-Albert Instrument Co.

BRUSH ROLLS
M. W. Jenkins Sons, Inc.
Gus Reidel & Son

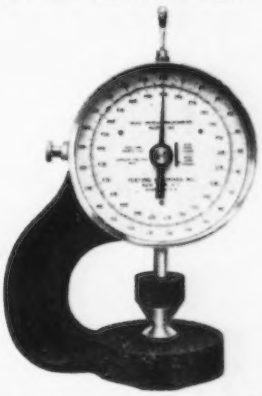
BRUSHES
M. W. Jenkins Sons, Inc.
Gus Reidel & Son
Smith & Winchester Mfg. Co.

BURSTING TESTERS
B. F. Perkins & Son Inc.
Testing Machines, Inc.

CALENDERS
The Bagley & Sewall Company
Beloit Iron Works

TMI **NEW MODEL 553 MICROMETER**

- Ideal for precise laboratory work or rugged production
- Capacity .500" in .001" divisions. Easy to read .0005".
- Large 6" dial, Simple zero adjustment.
- Dead weight load 8 lbs./ inch, Stainless Steel Anvils. Available in different weights, anvils sizes to meet many ASTM standards.



DON'T GUESS **TEST!**

Eliminate guess work in the laboratory and in production. We manufacture and distribute reliable, accurate — quality equipment for the paper, textile, plastics, metal, rubber and other industries.

TESTING MACHINES, Inc.
123 WEST 64th STREET, NEW YORK 23, N. Y.
SUSQUEHANNA 7-1228
CHECK TMI!—WE WILL GLADLY QUOTE ON YOUR TESTING NEEDS!

COMPLETE ENGINEERING AND CONSTRUCTION SERVICES FOR THE PULP AND PAPER INDUSTRY

If you have a problem involving any of the following, you can get immediate and experienced help from EBASCO engineers and consultants:

- **Design and Construction of Pulp and Paper Mills**
- **Steam and Hydro-Electric Power Plants**
- **Power Studies**
- **Reports and Appraisals**
- **Recovery Plants, Extensions and Alterations**

For complete details on EBASCO's various services send for "The Inside Story of Outside Help." Address Dept. P, Two Rector Street, New York 6, N. Y.

ENGINEERS · CONSTRUCTORS · EBASCO · BUSINESS CONSULTANTS

EBASCO SERVICES
INCORPORATED
NEW YORK · CHICAGO · WASHINGTON, D. C.

Black Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co., Inc.
Lobdell United Co.
The Moore & White Co.
Perkins & Sons, Inc., B. F.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

CARRIER ROPE
Williams-Gray Co.

CASEIN
Borden Company
Sheffield Chemical Co.

CASTINGS
Appleton Machine Co.
The Bagley & Sewall Company
Black Clawson Company
Babcock & Wilcox Co.
Carthage Machine Co.
Dilts Machine Works
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hamblet Machine Co.
Lobdell United Co.
Magnus Metal Corp.
Michigan Steel Casting Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Walworth Company

CENTRIFUGAL MACHINERY
Bird Machine Co.
Nichols Engrg. & Research Corp.
Ross, J. O., Engrg. Co.
Shartle Brothers Machine Co.

CHAINS
Jeffrey Mfg. Co.
Link Belt Co.

CHEMICAL COTTON PULP
Hercules Powder Co.

CHEMICAL SPRAYS
Vapo Systems Co.

CHEMICALS
American Cyanamid Co., Industrial Chem. Div.
Antara Chemicals Division, General Dyestuff Corp.
Calgon, Inc.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., Inc.
B. F. Goodrich Chemical Co.
Gottesman & Co.
Hercules Powder Co.
Heyden Chemical Corp.
Hooker Electrochemical Co.
Koppers Company, Inc.
Monsanto Chemical Company
National Aluminate Corp.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

CHESTS
The Bagley & Sewall Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Shartle Bros. Mch. Co.

CLAYS
United Clay Mines

CLEANING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Columbia-Southern Chem. Corp., Sub. of Pittsburgh Plate Glass Co.
Diamond Alkali Co.
The Dow Chemical Company
E. I. du Pont de Nemours & Co., Inc.
Monsanto Chemical Company
Nopco Chemical Co.
Wyandotte Chemicals Corp., J. B. Ford Division.

CLUTCHES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Hudson-Sharp Mch. Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

COARSE SCREENS
Bird Machine Company

COATING MACHINERY
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co., Inc.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corporation, John
Weber, Herman G., & Co., Inc.

COATING MATERIALS
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Co.
E. I. du Pont de Nemours & Co., Inc.
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
J. M. Huber Corp.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

COATINGS, CORROSION PROOF
Insul-Mastic Corp. of America

COMPRESSORS
Moorhead Elec. Machy. Co.
Nash Engineering Co.
Roots-Connersville Blower Corp.

CONDENSATE FILTERS
Hungerford & Terry, Inc.

CONDENSATION CONTROL
Insul-Mastic Corp. of America

CONDENSERS
Elliott Company, Inc.
Midwest Fulton Mch. Co.
Westinghouse Elec. Corp.

CONDITIONERS
Vapo Systems Co.

CONSISTENCY REGULATORS
Bird Machine Company
DeZurik Shower Company
Pandia, Inc.

CONSULTING ENGINEERS
Cummins & Barnard, Inc.
Ebasco Services
Frank W. Egan & Co.
Ferguson, H. K., Company
Alvin H. Johnson & Co., Inc.
Main, Inc., Chas. T.
Rust Engrg. Co.
J. E. Sirrine & Co.
Vapo Systems Co.
John Waldron Corp.

CONTINUOUS DIGESTER
Pandia, Inc.

CONTROLLERS
Black Clawson Company

CONTROLS
Johnson Corp.
Peirier Control Co.
Shartle Brothers Machine Co.
Westinghouse Electric Corp.

CONVERTING MACHINERY
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
Waldron, John, Corp.

CONVEYORS
Black Clawson Company
Downingtown Mfg. Co.
Enterprise Company
Jeffrey Mfg. Co.
Link Belt Co.
Murray, D. J., Mfg. Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.

CORES
Elixman Paper Co.
Mead Board Sales, Inc.
Sonoco Products Co.

CORROSION RESISTANT COATINGS
Insul-Mastic Corp. of America

COTTON LINTER
Hercules Powder Co., Inc.
Railway Supply & Mfg. Co.

COUCH ROLLS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Improved Machinery Inc.
Manchester Machine Co.
Stowe-Woodward Inc.

COUPLINGS
Ajax Flexible Coupling Co.
The Bagley & Sewall Company
Black Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Farrel-Birmingham Co., Inc.
Hermann Mfg. Co.
E. D. Jones & Sons Co.
Dodge Mfg. Corp.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works
Waldron Corp., John

CRANES
Whiting Corp.

CURL TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

CUTTERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Moore & White Co.
Perkins & Son, Inc., B. F.
The Sandy Hill Iron & Brass Works
The Smith & Winchester Mfg. Co.
Taylor, Stiles & Co.

CYLINDER MOULDS
Black Clawson Company
Downingtown Mfg. So.
Improved Machinery Inc.
Manchester Machine Co.

CYLINDERS
M. W. Jenkins Sons, Inc.

CYLINDER WIRES
Lindsay Wire Weaving Co.
Wisconsin Wire Works

DAMPENERS
Perkins & Son, Inc., B. F.
Valley Iron Works Co.

DEAERATING FEEDWATER HEATERS
Elliott Company, Inc.

DECKLE STRAPS
Stowe-Woodward Inc.

DECKLE WEBBING
Williams-Gray Co.

DEFOAMERS
Arnold, Hoffman & Co., Inc.

DEINKING
Bird Machine Co.
Dilts Machine Works
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DEINKING CHEMICALS
Antara Chemicals Division, General Dyestuffs Corp.
E. I. du Pont De Nemours & Co., Inc.
Jackson & Church Co.
Nopco Chemical Co.

DE-MINERALIZING EQUIPMENT
Hungerford & Terry, Inc.

DENSOMETERS
Testing Machines, Inc.
W. & L. E. Gurley

DESIGN CONSTRUCTION
Ebasco Services

DETERGENTS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

DEWAXING CHEMICALS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuffs Corp.
Nopco Chemical Co.

DIGESTER CIRCULATING SYSTEMS
Sandy Hill Iron & Brass Works

DIGESTERS
Babcock & Wilcox Co.
Bauer Bros. Co.
Blaw Knox Company
Chicago Bridge & Iron Co.
Pandia, Inc.
Pusey & Jones Corp.
A. O. Smith Corp.

DISPERSING AGENTS
Antara Chemicals Division, General Dyestuff Corp.
Calgon, Inc.
Diamond Alkali Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp. Michigan Alkali Div.

DOCTORS
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
Downingtown Mfg. Co.
Lobdell United Co.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

DOCTOR BLADES
The Bagley & Sewall Company
Bird Machine Company
Black Clawson Company
John W. Bolton & Sons, Inc.
Lodding Engineering Corp.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Westinghouse Electric Corp.

DRIERS
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Lukenweld
The Moore & White Co.
Murray Mfg. Co., D. J.
J. J. Ross Company
Red-Ray Mfg. Co., Inc.
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRIERS—LABORATORY
Testing Machines, Inc.

DRILLED SUCTION COUCH ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

DRILLED SUCTION DRUM ROLLS
Downingtown Mfg. Co.
Manchester Machine Co.

DRIVES
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Bird Machine Co.
Black Clawson Company
Dodge Mfg. Corp.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Jeffrey Mfg. Co.
General Electric Company
Gibbs-Brower Company, Inc.
Link Belt Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

DRUM WINDERS
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.

DRYER ROLL PYROMETER
Midwest Fulton Mch. Co.

Testing Machines, Inc.
Thwing-Albert Instrument Co.

DUSTERS
Appleton Machine Co.
Frank W. Egan & Co.
M. W. Jenkins Sons, Inc.
E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Waldron, John, Corp.

DUSTING BRUSHES
M. W. Jenkins Sons, Inc.

DYESTUFFS
Ciba Company
E. I. du Pont de Nemours & Co., Inc.
Geigy Co., The
General Dyestuff Corp.

ELECTRIC HYDROMETER
Testing Machines, Inc.

ELECTRIC HYGROMETER
Thwing-Albert Instrument Co.

ELECTRICAL PRECIPITATORS
Research Corporation

EMBOSSING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
John Waldron Corp.

EMBOSSING ROLLS
The Appleton Machine Co.
Gibbs-Brower Company, Inc.
Holyoke Machine Co.
B. F. Perkins & Son, Inc.
John Waldron Corp.

EMPLOYMENT SERVICE
Bixby, R. W., Inc.
Raymond, Chas. P., Service, Inc.

EMULSIFIERS
Antara Chemicals Division, General Dyestuff Corp.
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp.

ENZYMES
Rohm & Haas Company
Vanderbilt Co., R. T.

EVAPORATORS
Jackson & Church Co.
Murray, D. J., Mfg. Co.
Swenson Evaporator Co., Div. of Whiting Corp.
Westinghouse Electric Corp.

EXPANDERS
Mount Hope Machinery Co.

FANS
Buffalo Pumps, Inc.
General Electric Co.
B. F. Perkins & Son, Inc.
Roots-Connersville Div.
Ross Engineering Co., J. O.
Westinghouse Electric Corp.

FEEDERS
Jeffrey Mfg. Co.
Merrick Scale Mfg. Co.

FELTS
Albany Felt Co.
Appleton Woolen Mills
Asten-Hill Mfg. Co.
Draper Bros. Corp.
Huyck & Son, F. C.
Knox Woolen Company
Lockport Felt Co.
Morey Paper Mill Supply Co.
Shuler & Benninghofen
Waterbury Felt Co.
Williams-Gray Co.

FELT CLEANERS
Antara Chemicals Division, General Dyestuff Corp.
Calgon, Inc.
Nopco Chemical Co.

FELT CONDITIONERS
Bird Machine Co.
Downingtown Mfg. Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Barss Works

FELT EXPANDERS
Mount Hope Machinery Co.

FELT GUIDES
Black Clawson Company
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gilbert & Nash Co.
Moore & White Co.
The Noble & Wood Machine Co.
Mount Hope Machinery Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

FELT PRESERVERS
Mount Hope Machinery Co.

FIBRE BOARD MACHINES
Black Clawson Company
Sandy Hill Iron & Brass Works

FILLERS
American Cyanamid Company, Industrial Chemicals Division
J. M. Huber Corp.
A. M. Meincke & Son, Inc.
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

FILLINGS
John W. Bolton & Sons, Inc.
Chartle Brothers Machine Co.

FILTER MEDIA
Hungerford & Terry, Inc.
Palmer Filter Equipt. Co.

FILTERS
Bird Machine Company
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Johnson Corp.
Moore & White Co.
Ronningen Engineering Sales
J. O. Ross Engrg. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Walworth Company

FILTERS, LIME MUD
Bird Machine Company

FILTER SCREENS
Ronningen Engineering Sales

FINE SCREENS
Bird Machine Company
Sandy Hill Iron & Brass Works

FITTINGS
The Bagley & Sewall Company
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Shartle Brothers Machine Co.
Walworth Company

FLEXIBLE COUPLINGS
Dodge Manufacturing Corp.
Egan, Frank W., & Co.
Elliott Company, Inc.
Jeffrey Mfg. Co.
Shartle Brothers Machine Co.
John Waldron Corp.
Westinghouse Electric Corp.

FLOORING, GRATING AND TREADS
The Goodyear Tire & Rubber Company
Norton Co.

FLOTATION EQUIPMENT
Walker Process Equipment, Inc.

FLOW BOXES
Lukens Steel Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FLUID FILTERS
Ronningen Engineering Sales

FOLDERS
Emerson Mfg. Co.

FORMATION TESTERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

FOURDRINIERS
Beloit Iron Works
Black Clawson Company
Downingtown Mfg. Co.
Manchester Machine Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

FREENESS TESTERS
Testing Machines, Inc.

GASKETS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

GEAR MOTORS
Elliott Company, Inc.
Westinghouse Electric Corp.

GEAR REDUCERS
Dodge Mfg. Corp.
Downingtown Mfg. Co.

GEAR REDUCER DRIVES
Link Belt Co.

WEST VIRGINIA QUALITY

WEST VIRGINIA PULP and PAPER COMPANY

Manufacturers of West Virginia Mill Brand Papers

SUPERCALENDERED • POSTER • BOND • COVER
LITHOGRAPH • LABEL • OFFSET • MUSIC • WRITING
EGGSHELL • INDEX BRISTOL • CUP AND CONTAINER
ENVELOPE • MIMEOGRAPH • FILE FOLDER • COATED
ENGLISH FINISH • POSTCARD • MACHINE COATED

KRAFT LINER BOARD • SEMI-CHEMICAL CORRUGATING BOARD
KRAFT CONVERTING AND KRAFT ENVELOPE

MILLS

Mechanicville, New York — Tyrone, Pennsylvania
Luke, Maryland — Williamsburg, Pennsylvania
Covington, Virginia — Charleston, South Carolina

WEST VIRGINIA PULP and PAPER COMPANY
230 Park Avenue, New York 17, N. Y.
35 East Wacker Drive, Chicago 1, Ill. — 503 Market St., San Francisco 5, Calif.

CHEMIPULP PROCESS INC.
500 WOOLWORTH BUILDING — WATERTOWN, NEW YORK

CHEMICAL PULPING PROCESS

Hot Acid Cooking and Recovery Systems
Chemipulp—K-C Digester Circulating Systems
Chemipulp—K-C Improved Acid Plants
Digester Waste Liquor SO_2 Gas and Heat Recovery
Chip Pretreatment Preparatory to Cooking

Associated with
CHEMIPULP PROCESS LTD.
403 CRESCENT BUILDING — MONTREAL, P. Q.

Pacific Coast Representative
A. H. LUNDBERG
308 ORPHEUM BUILDING — SEATTLE 1, WASH.

WEYERHAEUSER

BLEACHED SULPHITE
KRAFT CONTAINER BOARD

BLEACHED SULPHATE
BLEACHED KRAFT PAPERBOARD

GEARS
The Bagley & Sewall Company
Black Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Frank W. Egan & Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

GRAPPLES
Blaw-Knox Company
Owen Bucket Co.
Wellman Engrg. Co.

GRINDERS
Carthage Machine Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Hanchett Mfg. Co.
Lobdell United Co.
Norton Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
Norton Company
Simonds Abrasive Co.

GUIDES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Gilbert & Nash Co.
The Moore & White Co.
Mount Hope Machinery Co.
Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMMING MACHINES
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
The Sandy Hill Iron & Brass Works
Waldron, John, Corp.

GUMS
Hercules Powder Co., Inc.
National Starch Products, Inc.

HEAT EXCHANGERS AND RECOVERY SYSTEMS
Westinghouse Electric Corp.

HEATING, VENTILATING & AIR CONDITIONING
The Appleton Machine Co.
E. D. Jones & Sons Co.
General Electric Co.
Jackson & Church Co.
D. J. Murray Mfg. Co.
Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Westinghouse Electric Corp.

HONING KIT
John W. Bolton & Sons, Inc.

HOSE (Air, Water, Suction, etc.)
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company

HUMECTANTS
Aktivin Division, Heyden Chemical Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

HYDRAULIC OSCILLATING SHOWERS
Ronningen Engineering Sales

HYDRAULIC TURBINES & ACCESSORIES
James Leffel Co.

IMPREGNANTS
American Cyanamid Company, Industrial Chemicals Division
Sun Oil Company
B. F. Goodrich Chemical Co.

INDENTING MACHINES
Dilts Machine Works

INDUSTRIAL CONTROL
Westinghouse Electric Corp.

INDUSTRIAL TIRES
B. F. Goodrich Co.

INDUSTRIAL TRACTORS
Towmotor Corp.

INKOMETER
Thwing-Albert Instrument Co.

INSTRUMENTS, TESTING AND MEASURING
Black-Clawson Co.
General Electric Co.
W. & L. E. Gurley
B. F. Perkins & Son
Taylor Instrument Cos.
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Tracerlab, Inc.
Westinghouse Electric Corp.

INSULATION
Insul-Mastic Corp. of America

JACKETS
Emerson Mfg. Co.

JOINTS
The Bagley & Sewall Company
Beloit Iron Works
Cram Associates
Downingtown Mfg. Co.
Johnson Corp.
Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

JORDANS
Emerson Mfg. Co.
Shartle Brothers Machine Co.

JORDAN FILLINGS
Appleton Machine Co.
Bahr Bros. Manufacturing Co.
John W. Bolton & Sons, Inc.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KILNS
Jackson & Church Co.
F. L. Smidth & Co.

KNIVES
Black Clawson Company
John W. Bolton & Sons, Inc.
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
The Moore & White Co.
Shartle Brothers Machine Co.
Simonds Saw & Steel Co.
Taylor Stiles & Co.
Valley Iron Works Co.

KNOTTERS
Black Clawson Company
Improved Machinery, Inc.
Sandy Hill Iron & Brass Works

LABORATORY CORRUGATOR
Testing Machines, Inc.
Thwing-Albert Instrument Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
Bauer Brothers Co.
Bird Machine Company
Dilts Machine Works
Downingtown Mfg. Co.
W. & L. E. Gurley
Egan, Frank W., & Co.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.
Taylor Instrument Companies
Testing Machines, Inc.
Thwing-Albert Instrument Co.
Valley Iron Works Co.
Waldron, John, Corp.

LAMINATING MACHINES
The Bagley & Sewall Company
Dilts Machine Works
Egan, Frank W., & Co.
Paper Converting Machine Co.
Waldron, John, Corp.

LAY BOYS
Dilts Machine Works
Gibbs-Brower Company, Inc.
Hamblet Machine Co.
Moore & White Co.

LINTER PULP
Hercules Powder Co., Inc.

LUBRICANTS
Cities Service Oil Co.
Gulf Oil Corp.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
The Texas Company

MACHINERY, CARBON PAPER
Haida Engineering Co.

MAGAZINE REELS
Dilts Machine Works

MAGNETIC SEPARATORS
Bauer Bros. Co.
Shartle Brothers Machine Co.

MATERIALS HANDLING
Dilts Machine Works
Downingtown Mfg. Co.
Jeffery Mfg. Co.
Link Belt Co.
Shartle Bros. Mch. Co.
Towmotor Corp.
The Wellman Engrg. Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Lobdell Co.
Testing Machines, Inc.

MIXERS
Jackson & Church Co.
Mixing Equipment Co.
Walker Process Equipment, Inc.

MICRO-CRYSTALLINE WAXES
Sun Oil Company

MOISTURE CONTENT CONTROL
Testing Machines, Inc.
Vapo Systems Co.

MOISTURE METERS
Testing Machines, Inc.

MOTORS
Allis Chalmers Mfg. Co.
Elliott Company
Moorhead Elec. Machy. Co.

MOTORS AND GENERATORS
Elliott Company, Inc.
General Electric Company
Moorhead Elec. Machy. Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric Corp.

NICKEL AND NICKEL ALLOYS
The International Nickel Co.

PACKING BOXES
Johnson Corporation
The Moore & White Co.
Shartle Brothers Machine Co.

PAPER CONDITIONERS
Vapo Systems Co.

PAPER MACHINE DRIVES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Co.
Dowington Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Westinghouse Electric Corp.

PAPER MACHINES
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Company
Downington Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Lukenweld
Manchester Machine Co.
Moore & White Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

PAPER MACHINE SLICES
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER MILL MACHINERY
Ronningen Engineering Sales

PAPER TUBE MACHINERY
Dietz Machine Works
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Paper Converting Machine Co.

PARAFFINE WAXES
Sun Oil Company

PARAFFIN WAX EMULSIONS
American Cyanamid Co., Ind. Chem. Div.
Hercules Powder Co., Inc.
Nopco Chemical Co.

PASTING MACHINES
Beloit Iron Works
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Murray, D. J., Mfg. Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

PEBBLE MILLS
F. L. Smidth & Co.

pH METERS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PIPE
Armco Drainage & Metal Products, Inc.
Babcox & Wilcox Co.
Crane Company
Grinnell Company
National Tube Co.
Walworth Company

PIPE FABRICATORS
Pittsburgh Piping & Equipt. Co.

PIPE FITTINGS
Armco Drainage & Metal Products, Inc.
Crane Company
Grinnell Company
Pittsburgh Piping & Equipt. Co.
Walworth Co.

PIPING, HIGH PRESSURE
Pittsburgh Piping & Equipt. Co.

PITCH CONTROL
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Rohm & Haas Company

PLASTICIZERS
American Cyanamid Company Industrial Chemicals Company
Aktivin Division, Heyden Chemical Corp.
B. F. Goodrich Chemical Co.
Jackson & Church Co.
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Rohm & Haas Company

PLATERS
Gibbs-Brower Company, Inc.
Perkins & Son, Inc., B. F.

PLATES
Armco Steel Corp.
Babcock & Wilcox Co.
Lukenweld Division
Lukens Steel Company
L. O. Ross Engrg. Corp.
Timken Roller Bearing Co.

PLUGS
The Appleton Machine Co.
Black Clawson Company
Emerson Mfg. Co.
E. D. Jones & Sons Co.
Shartle Brothers Machine Co.

POPE TYPE REELS
Black-Clawson Company
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

PRESERVATIVES
Antara Chemicals Division, General Dyestuff Corp.
E. I. du Pont de Nemours & Co.

PRESS ROLLS
Beloit Iron Works
Black-Clawson Co.
Downingtown Mfg. Co.
Goodrich, B. F., Company, Inc.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Stowe-Woodward Inc.

PRESSURE FILTERS
Holyoke Machine Co.
Hungerford & Terry, Inc.
Jackson & Church Co.
Ronningen Engineering Sales
Sandy Hill Iron & Brass Works

PRESSURE VESSELS
Chicago Bridge & Iron Co.
A. O. Smith Corp.

PRESSES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
Dietz Machine Works
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Heinrich, H. H., Co.
Hudson-Sharp Machine Co.
Jackson & Church Co.
Manchester Machine Co.
The Moore & White Co.
Paper Converting Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Testing Machines, Inc.
Valley Iron Works Co.
Waldron Corp., John
H. G. Weber & Co., Inc.

PROTECTIVE COATINGS
Insul-Mastic Corp. of America

PULLEYS
Bird Machine Company
Black-Clawson Co.
Dodge Mfg. Corp.
Sandy Hill Iron & Brass Works

PULP CLASSIFIER
The Bauer Bros. Co.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

PULP CLEANERS
Bauer Bros. Co.
Bird Machine Co.
Nichols Engrg. & Research Corp.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP REFINERS
Emerson Mfg. Co.
Shartle Bros. Machine Co.

PULP SCREENS
Bird Machine Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULP STOCK VALVES
Crane Company
Grinnell Company
Murray, D. J., Mfg. Co.
Record Fdy. & Mach. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

PULP WASHERS
Mundt, Chas. & Sons
Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

PULPERS
Apmew, Inc.
Bauer Brothers Co.
Cowles Company
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Midwest Fulton Mch. Co.
Morden Machines Co.
Shartle Brothers Machine Co.

PULPS
Brown Company
Gottesman & Co., Inc.
Lyddon & Co. (America), Inc.
Parsons & Whittemore, Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.
Restigouche Co., Ltd.

PULPSTONES
Norton Company

PULP TESTERS
Testing Machines, Inc.

PULP TREATING
Curlator Corp.

PULVERIZING MILLS
Jeffery Mfg. Co.
F. L. Smidth & Co.

PUMP VALVE BALLS
Stowe-Woodward Inc.

PUMPS
Allis Chalmers Mfg. Co.
Apmew, Inc.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Buffalo Pumps, Inc.
DeLaval Steam Turbine Co.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Ronningen Engineering Sales
Roots Connersville Blower Corp.
J. J. Ross Company
Ross Paper Machy. Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

RADIANT BURNERS
Red-Ray Mfg. Co., Inc.

RAG COOKING PROCESSES
General Dyestuff Corp.
Rohm & Haas Company

RAG CUTTERS
Gibbs-Brower Company, Inc.
B. F. Perkins & Son, Inc.
Taylor-Stiles & Co.

RECOVERY SYSTEMS
Babcock & Wilsen Co.
Chicago Bridge & Iron Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Peabody Engrg. Corp.
Pusey & Jones Corp
Ross Engineering Corp., J. O.
Valley Iron Works Co.
Vulcan Copper & Supply Co.

REELS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works (Kohler Systems)
Egan, Frank W., & Co.
Downingtown Mfg. Co.
Hudson-Sharp Mch. Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.
Waldron, John, Corp.

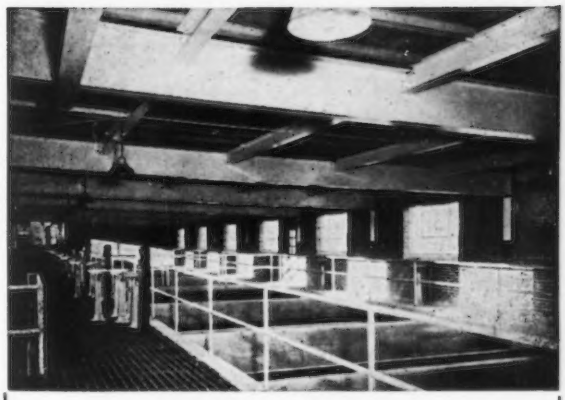
REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Curlator Corp.
Dilts Machine Works
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Hermann Mfg. Co.
Jackson & Church Co.
E. D. Jones & Sons Co.
Morden Machines Co.
Murray, D. J., Mfg. Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sutherland Refiner Corp.
Valley Iron Works

REFRACTORIES
Harbison-Walker Refractories Co.

REGULATORS
Apmew, Inc.
Bird Machine Company
General Electric Co.
Improved Machinery Inc.
Johnson Corp.
Poirier Control Company
Shartle Brothers Machine Co.
Taylor Instrument Companies
Westinghouse Electric Corp.

RESINS
American Cyanamid Company, Plastics & Resins Division
Borden Company
The Dow Chemical Company
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Koppers Company, Inc.
Monsanto Chemical Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.
Pennsylvania Indust. Chem. Corp.
Rohm & Haas Company

ROLLS
Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Emerson Mfg. Co.
Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
B. F. Goodrich Co.
Holyoke Machine Co.
Lindsay Wire Weaving Co.
Lobdell United Co.
Manchester Machine Co.
The Moore & White Co.
D. J. Murray Mfg. Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works



Concrete Gravity Air-Water-Wash type water Filtration Plant producing, at low cost, water with turbidity 0, color under 5 and iron 0.05 p.p.m. Fe.

OTHER PRODUCTS

Demineralizing Plants
Water Softening Plants
Pressure Filter Plants
and

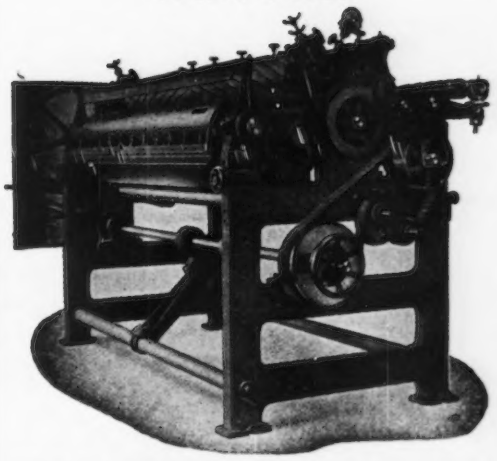
All other types of water treating systems, including strainer valves, air wash systems, filter sand and anthracite beds and all filter repair and replacement parts. Over 50 years experience building new and modernizing old water treatment plants.

Write for FREE Bulletins

H&T SERVICE
HUNGERFORD & TERRY, INC.
CLAYTON 4, NEW JERSEY

MODEL 28

ROLLER BEARING CUTTER



HAMBLET MACHINE CO.
LAWRENCE, MASS.
MAKERS OF
SINGLE, DUPLEX AND DIAGONAL PAPER CUTTERS
CUTTER KNIVES, PATENT TOP SLITTERS

Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Stowe-Woodward Inc.
Tyer Rubber Co.
U. S. Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.

ROLL HANDLING EQUIPMENT
Dilts Machine Works

ROLL STANDS
Cameron Machine Co.
Dilts Machine Works
Frank W. Egan & Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
John Waldron Corp.
H. G. Weber & Co., Inc.

ROPE CARRIERS
Black Clawson Co.
Downingtown Mfg. Co.
The Moore & White Co.
The Sandy Hill Iron & Brass Works

ROTARY KILNS
F. L. Smidth & Co.

ROTARY SCREENS
Bird Machine Company

ROTARY STEAM JOINTS
Johnson Corp.
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Bros. Mch. Co.

RUBBER COVERED ROLLS
Stowe-Woodward Inc.

RUBBER PRODUCTS
B. F. Goodrich Co.
The Goodyear Tire & Rubber Company
Stowe-Woodward Inc.

SAMPLE CUTTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SATURANTS
B. F. Goodrich Chemical Co.

SATURATING MACHINES
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

SAVEALLS
Bird Machine Company
Bulkley, Dunton Processes, Inc.
Chicago Bridge & Iron Co.
Improved Paper Machinery Corp.
Moore & White Co.
Shartle Bros. Machine Co.
Walker Process Equipment, Inc.

SAWS
Simonds Saw & Steel Co.
Moore & White Co.

SCALES
Merrick Scale Mfg. Co.
Testing Machines, Inc.

SCREEN PLATES
Bird Machine Company
Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

SCREENS
Appleton Wire Works
Appleton Machine Company
The Bagley & Sewall Company
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
E. D. Jones & Sons Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SCREENS, CHIP (Vibrating)
Link Belt Co.

SCREENS (Rotary)
Bird Machine Company

SHAKES
Black Clawson Company
Downingtown Mfg. Co.

SHAKE STICKS
Westinghouse Electric Corp.

SHEET MACHINES
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hermann Mfg. Co.
Testing Machines, Inc.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
Black-Clawson Company
Downingtown Mfg. Co.
Emerson Mfg. Co.
Moore & White Co.
Sandy Hill Iron & Brass Works
Sandusky Fdy. & Mch. Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.
Gibbs-Brower Company, Inc.
Jackson & Church Co.
Jeffrey Mfg. Co.
Taylor, Stiles & Co.

SIZE PRESSES
Black-Clawson Co.
Downingtown Mfg. Co.
Manchester Machine Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

SIZING
American Bitumuls & Asphalt Co.
American Cyanamid Company, Industrial Chemicals Division
The Dow Chemical Company
du Pont, E. I., de Nemours & Co.
Glidden Company
Hercules Powder Co.
The Hubinger Co.
Monsanto Chemical Company
National Aluminate Corp.
Nopco Chemical Co.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SIZING TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SLIME CONTROL
Antara Chemicals Division, General Dyestuff Corp.
The Dow Chemical Company
E. I. du Pont de Nemours & Co.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Company
Vanderbilt Co., R. T.
Wyandotte Chemicals Corp., Michigan Alkali Div.

SLITTERS
The Bagley & Sewall Company
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson-Sharp Mch. Co.
Improved Machinery Inc.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Paper Converting Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SMOKE STACKS
Chicago Bridge & Iron Co.

SOFTNESS-STIFFNESS TESTER
W. & L. E. Gurley
Testing Machines, Inc.
Thwing-Albert Instrument Co.

SOLUBLE OILS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Nopco Chemical Co.

SPECIAL MACHINERY
Black Clawson Company
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Jackson & Church Co.
Manchester Machine Co.
Moore & White Co.
Murray, D. J., Mfg. Co.
Paper Converting Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.
Waldron, John, Corp.

SPEED REDUCERS
Dodge Manufacturing Corp.
Downingtown Mfg. Co.
Link Belt Co.
Westinghouse Elec. Corp.

SPLICING TISSUE
Williams-Gray Co.

STAINLESS AND ALLOY CASTINGS
Michigan Steel Casting Co.

STAINLESS STEEL
Armco Steel Corp.
Crucible Steel Co.
U. S. Steel Corp.

STARCH
Clinton Foods, Inc.
Corn Products Sales Co.
The Hubinger Co.
National Starch Products, Inc.

STEAM JET EJECTORS
Elliott Company, Inc.

STEAM JOINTS
The Moore & White Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

STEAM SPECIALTIES
Babcock & Wilcox Co.
Johnson Corp.

STEEL
Armco Steel Corp.
Carnegie Illinois Steel Co.
Crucible Steel Co.
Lukens Steel Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD
Babcock & Wilcox Co.
Lukens Steel Company

STEEL TANKS
Chicago Bridge & Iron Co.
Jackson & Church Co.
The Sandy Hill Iron & Brass Works
Shartle Bros. Machine Co.

STOKERS
Westinghouse Elec. Corp.

STRAINER SCREENS
Ronningen Engineering Sales

STRAINERS
Elliott Company, Inc.
Ronningen Engineering Sales

STRETCH TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOX COVERS
Appleton Wood Products
Emerson Mfg. Co.
Moore & White Co.
Westinghouse Electric Corp.

SUCTION BOXES
Beloit Iron Works
Black-Clawson Company
Downingtown Mfg. Co.
E. D. Jones & Son Co.
Manchester Machine Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co

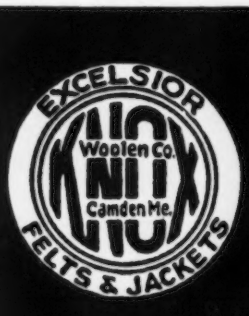
SUCTION ROLLS
Beloit Iron Works
Downingtown Mfg. Co.
Manchester Machine Co.

SULPHUR
Texas Gulf Sulphur Co.

SULPHUR BURNERS
Valley Iron Works Co.

SULPHUR DIOXIDE
Virginia Smelting Co.

SUPERCALENDERS
The Appleton Machine Co.
B. F. Perkins & Son, Inc.



"EXCELSIOR" FELTS

The Trademark of Felts of Superior Quality for Every Grade of Pulp and Paper

KNOX WOOLEN COMPANY
CAMDEN, MAINE

SWITCHGEAR
Westinghouse Elec. Corp.

SYNTHETIC LATICES
American Cyanamid Company, Industrial Chemicals Division
B. F. Goodrich Chemical Co.
The Goodyear Tire & Rubber Company
Naugatuck Chemical Division of U. S. Rubber Co.
Nopco Chemical Co.

SYNTHETIC RESINS
American Cyanamid Co., Ind. Chem. Div.
Hercules Powder Co., Inc.
Rohm & Haas Company

SYPHONS
Poirier Control Company
Shartle Bros. Machine Co.

TAILING SCREENS
Sandy Hill Iron & Brass Works

TAKE OFF UNITS
Dilts Machine Works

TALC
American Cyanamid Company, Industrial Chemicals Division
Vanderbilt Co., R. T.

TANKS
Chicago Bridge & Iron Co.
B. F. Perkins & Sons, Inc.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Stebbins Engrg. Co.

TEARING TESTERS
Thwing-Albert Instrument Co.
Testing Machines, Inc.

TENSILE TESTERS
B. F. Perkins & Son, Inc.
Testing Machines, Inc.
Thwing-Albert Instrument Co.

THICKENERS, DECKERS AND SAVEALLS
The Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Chicago Bridge & Iron Co.
Dilts Machine Works
Downingtown Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
D. J. Murray Mfg. Co.
Ross Paper Machinery Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walker Process Equipment, Inc.

TITANIUM
E. I. du Pont de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.

TOOLS
Walworth Company

TRACTORS AND TRUCKS
Towmotor Corp.

TRANSFORMERS
Moorhead Elec. Machy. Co.
Westinghouse Elec. Corp.

TRANSMISSIONS
Dodge Mfg. Corp.
Jeffrey Mfg. Co.
Link Belt Co.

TRAPS
Crane Co.
Grinnell Company
Johnson Corporation
Shartle Brothers Machine Co.

TUBE CLEANERS
Elliott Company, Inc

TUBE MILLS
F. L. Smidth & Co.

TUBES
Babcock & Wilcox Co.
Crucible Steel Co.
National Tube Co.

TUBING MACHINES
Dilts Machine Works

TUBING, MECHANICAL
National Tube Co.

TURBINES
De Laval Turbine Co.
Elliott Company, Inc.
General Electric Company
James Leffel Co.
Westinghouse Electric Corp.

UNWINDERS
Dilts Machine Works
Downingtown Mfg. Co.
Egan, Frank W., & Co.
Moore & White Co.
Waldron, John, Corp.

USED EQUIPMENT
Gibbs-Brower Co.
Thomas W. Hall Co.
Moorhead Elec. Machy. Co.
I. J. Ross Company
Ross Paper Machinery Co.
Shartle Brothers Machine Co.

V-BELTS
Dodge Mfg. Corp.
Goodrich, B. F., Company, Inc.

VALVES
The Bagley & Sewall Company
Crane Company
DeZurik Shower Co.
Dilts Machine Works
Downingtown Mfg. Co.
Grinnell Company
E. D. Jones & Sons Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Ohio Injector Co.
Powell Valves
Record Fdy. & Mch. Co.
Rockwell Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.
Walworth Company

VAPOR BARRIER COATINGS
Insul-Mastic Corp. of America

VATS
Beloit Iron Works
Biggs Boiler Works Co.
Black-Clawson Co.
Downingtown Mfg. Co.
Moore & White Co.
Sandy Hill Iron & Brass Works

WASHERS
The Bagley & Sewall Company
Downingtown Mfg. Co.
Gibbs-Brower Company, Inc.
Improved Machinery Inc.
Jackson & Church Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

WASTE TREATING EQUIPMENT
Hungerford & Terry, Inc.
Jeffrey Mfg. Co.
Link Belt Co.
Walker Process Equipment, Inc.

WATER CONDITIONING
American Cyanamid Co., Industrial Chem. Div.
Calgon, Inc.
General Dyestuff Corp.
Hungerford & Terry, Inc.
National Aluminate Corp.
Palmer Filter Equipt. Co.
Ronnigen Engineering Sales
The Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

WATER DISPERSIONS
American Cyanamid Company, Industrial Chemicals Division
Naugatuck Chemical Division of U. S. Rubber Co.
Rohm & Haas Company

WATER FILTERS
Bird Machine Co.
Holyoke Machine Co.
Hungerford & Terry, Inc.
Improved Machinery Inc.
Ronningen Engineering Sales
Sandy Hill Iron & Brass Works
Walker Process Equipment, Inc.

WATER PENETRATION TESTER
Testing Machines, Inc.
Thwing-Albert Instrument Co.

WATER SOFTENERS
Antara Chemicals Division, General Dyestuff Corp.
Hungerford & Terry, Inc.
Wyandotte Chemicals Corp., Michigan Alkali Div.

WATER TREATING EQUIPMENT
Hungerford & Terry, Inc.
Walker Process Equipment, Inc.

WATER VAPOR CUPS
Testing Machines, Inc.
Thwing-Albert Instrument Co.

WATER WHEELS
James Leffel Co.

WAXING MACHINERY
Black-Clawson Company
Dilts Machine Works
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
The Mayer Machine Co.
Moore & White Co.
Paper Converting Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WEB TENSION CONTROL
Dilts Machine Works
Egan, Frank W., & Co.
Waldron, John, Corp.

WELDING EQUIPMENT
General Electric Company
Walworth Company
Westinghouse Electric Corp.

WELDING FITTINGS
Pittsburgh Piping & Equipt. Co.

WET MACHINES
The Bagley & Sewall Company
Black-Clawson Company
Carthage Machine Co.
Downingtown Mfg. Co.
Improved Machinery Inc.
Moore & White Co.
Pusey & Jones Corp.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WET STRENGTHENING AGENTS
American Cyanamid Company, Industrial Chemicals Division
Hercules Powder Co., Inc.
Rohm & Haas Company

WETTING AGENTS
American Cyanamid Company, Industrial Chemicals Division
Antara Chemicals Division, General Dyestuff Corp.
Diamond Alkali Co.
Monsanto Chemical Company
Nopco Chemical Co.
Rohm & Haas Company
Wyandotte Chemicals Corp., Michigan Alkali Div.

WHITE WATER STRAINERS
Ronningen Engineering Sales

WHITE WATER TREATING EQUIPT.
Bird Machine Co.
Bulkley, Dunton Processes, Inc.
Hungerford & Terry, Inc.
The Sandy Hill Iron & Brass Works

WINDERS & REWINDERS
The Appleton Machine Co.
The Bagley & Sewall Company
Beloit Iron Works
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Dilts Machine Works
Downingtown Mfg. Co.
Frank W. Egan & Co.
Gibbs-Brower Company, Inc.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Langston Co., Samuel M.
Manchester Machine Co.
Moore & White Co.
Paper Converting Machine Co.
Pusey & Jones Corp.
Ross Paper Machinery Co.
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron, John, Corp.

WINDER & REWINDER DRIVES
Reliance Elec. & Engrg. Co.

WINDING ROLL CHANGERS
Dilts Machine Works
Egan, Frank W., & Co.
Waldron, John, Corp.

WIRE BRUSHES
M. W. Jenkins Sons, Inc.
Williams-Gray Co.

WIRE GUIDES
Black-Clawson Company
Gilbert & Nash
Moore & White Co.

WIRES
Appleton Wire Works
International Wire Works
Lindsay Wire Weaving Co.
Williams-Gray Co.
Wisconsin Wire Works

WOOD SPLITTERS
The Appleton Machine Co.
Cartnage Machine Co.
Manchester Machine Co.
Moore & White Co.

Supplying Your Requirements

AMERICA'S LEADING INDEPENDENT WASTE PAPER PACKERS

WASHINGTON, D. C.
CAMDEN, N. J.
NEW YORK, N. Y.
MINNEAPOLIS, MINN.

THOMAS PAPER STOCK COMPANY
1500 No. Hooker Street • Chicago 22, Ill.

PAPER TRADE JOURNAL

INDEX TO ADVERTISERS

PAPER TRADE JOURNAL

A

Albany Felt Co. — —
Allis Chalmers — 2
American Bitumuls & Asphalt Co. — —
American Cyanamid Co., Industrial Chemicals Div. — —
American Steel & Wire Co. — —
Antara Chem. Div., General Dyestuff Corp. — —
Anthracite Equip. Corp. — —
Apmew, Inc. — —
Appleton Machine Co., The — —
Appleton Wire Works — —
Appleton Woolen Mills — —
Armco Drainage & Metal Products — —
Armco Steel Corp. — —
Arnold, Hoffman & Co., Inc. — —
Asten-Hill Mfg. Co. — —
Atkins Saw Div., Borg Warner Corp. — —

B

Babcock & Wilcox Co. — —
Bagley & Sewall Co. — —
Bahr Bros. Mfg. Co. — —
Bailey Meter Co. — —
Barrell, Wm. L., Co. — —
Bauer Bros Co. — —
Behrens Sales Co. — —
Beloit Iron Works Co. — —
Bird Machine Co. — —
Bixby, R. W., Inc. — 40
Black-Clawson Co. — 21
Blaw-Knox Co. — —
Bolton, John W., & Sons, Inc. — —
Bowsher, Co., N. P. — —
Brown Co. — —
Buffalo Forge Co. — —
Buffalo Pumps, Inc. — 4

C

Calgon, Inc. — —
Cameron Machine Co. — —
Carthage Machine Co. — —
Chemipulp Process, Inc. — 45
Chicago Bridge & Iron Co. — —
Chicago Eastern Illinois R. R. — —
Ciba Company — —
Cities Service — —
Clearing House — 39
Classified Advertising — 39
Clinton Foods, Inc. — —
Columbia-Geneva Steel Div. — —
Columbia-Southern Chem. Corp. Sub. of Pittsburgh Plate Glass Co. — —
Corn Products Sales Co. — —
Cowles Co., Inc. — —
Cram Associates — —
Crane Co. — —
Crucible Steel Corp. of America — —
Cummins & Barnard, Inc. — —

D

Davis, Frank H., Co. — —
DeLaval Steam Turbine Co. — —
DeZurik Shower Co. — —
Diamond Alkali Co. — —
Dietz Machine Works — —
Dilts Machine Works — 21
Dodge Manufacturing Co. — —
Dow Chemical Co. — —
Downingtown Mfg. Co. — —
Draper Brothers Co. — —
du Pont, E. I., de Nemours & Co. Aromatics Div. — —
du Pont, E. I., de Nemours & Co. Grasseli Dept. — —
du Pont, E. I., de Nemours & Co. Pigment Dept. — —
du Pont, E. I., de Nemours & Co. Organic Dept. — —

E

Ebasco Services, Inc. — 43
Egan, Frank W., & Co. — —
Elixman Paper Core Co. — 24
Elliott Co. — —
English China Clays Sales Corp. — —
Enterprise Co. — —

F

Farrel-Birmingham Co., Inc. — —
Ferguson, The H. K., Co. — —
Fitchburg Screen Plate Co. — —
Foxboro — —

G

Geigy Co. — Front Cover
General Dyestuff Corp. — —
General Electric Co. — —
Gibbs-Brower Co. — —
Gilbert & Nash — —
Glidden Co. — —
Goodyear Tire & Rubber Co. — —
Goodrich Co., B. F. — 3
Goodrich Chemical Co. — —
Gottesman & Co. — —
Grinnell Co., Inc. — 31
Gurley, W. & L., E. — —

H

Haida Engineering Co. — —
Hall, Thomas W., Co., Inc. — 40
Hamblet Machine Co. — 47
Hanchett Mfg. Co. — —
Harbison-Walker Refractories — —
Hardinge Co., Inc. — —
Hercules Powder Co. — —
Hermann Manfg. Co. — —
Heyden Chemical Co. — —
Holyoke Machine Co. — —
Hooker Electrochemical Co. — —
Huber, J. M. Corp. — —
Hubinger Co., The — —
Hudson-Sharp Machine Co. — —
Hungerford & Terry, Inc. — 47
Huyck, F. C., & Sons — —

I

Improved Machinery, Inc. — —
Insulmastic Corp. of America — —
International Nickel Co. — —
International Wire Works — —

J

Jackson & Church Co. — —
Jeffrey Mfg. Co. — 13
Jenkins, M. W., Sons, Inc. — —
Johnson Corp., The — —
Johnson, Alvin H., & Co. — —
Jones, E. D., & Sons Co. — —

K

Kalamazoo Sheet Metal & Mfg. Co. — —
Kinsley Chemical Co. — —
Knox Woolen Co. — 48
Koppers Co., Inc. — —

L

Langston, Samuel M., Co. — —
Leffel, James, & Co. — —
Lindsay Wire Weaving Co. — —
Link Belt Co. — —
Lobdell United Co. — —
Lockport Felt Co. — —
Lodding Engineering Co. — —
Lukens Steel Co. — —
Lyddon & Co. — —

M

Magnus Metal Corp. — —
Main, Charles T., Inc. — 38
Manchester Machine Co. — —
Mead Board Sales, Inc. — 20
Mead Sales Co. — —
Meincke & Son — —
Mercer Paper Tube Co. — 38
Merrick Scale Co. — —
Michigan Steel Casting Co. — —
Midwest-Fulton Co. — —
Mixing Equipment Co. — —
Monsanto Chemical Co. — —
Moore & White — —
Moorhead Electrical Machinery. — —
Morden Machines Co. — —
Morningstar, Nicol, Inc. — —
Mount Hope Machinery Co. — —
Murray, D. J., Mfg. Co. — —

N

Nash Engineering Co. — 33
National Aluminate Corp. — —
National Gypsum Co. — —
National Starch Products, Inc. — —
National Tube Co. — —
Newport News Shipbldg. & Dry Dock Co. — —
Nopco Chemical Co. — —
Nordstrom Valve Div. of Rockwell Mfg Co. — —
Norton Co. — —

O

Ohio Injector Co. — —
Oshorne Paper Mill Equipment Corp. — 40 & 42
Owen Bucket Co. — —

P

Pandia, Inc. — —
Paper Converting Mach. Co. — —
Parsons & Whittemore — —
Pennsylvania Industrial Chem. Corp. — —
Perkins, B. F., & Sons Co. — —
Perkins Goodwin Co. — —
Pioneer Paper Stock Co. — 36
Pittsburgh Plate Glass Co. — —
Poirier Control Co. — —
Potdevin Machine Co. — —
Powell Valves — —
Price & Pierce, Ltd. — —
Pulp & Paper Trading Co. — —
Pusey & Jones Corp., The — —

R

Raymond, Chas. P., Service, Inc. — 39
Record Fdy. & Machine Co. — 37
Red Ray Manufacturing Co., Inc. — —
Reliance Elec. & Engrg. Co. — —
Research Corp. — —
Restigouche Co., Ltd. — —
Reidel, Gus & Son — —
Rockwell Mfg. Co. — —
Rohm & Haas Co. — 23
Riegel Paper Corp. — —
Ronningen Engrg. Sales — —
Ronnington-Petter Co. — —
Roosevelt Paper Co. — —
Roots-Connersville Blower Co. — 25
Ross, J. J., Co. — 41
Ross, J. O., Engrg. Corp. — —
Ross Paper Machinery Co. — 40
Rotherm Engrg. Co. — —
Rust Engineering Co. — 38

S

Sandusky Fdy. Mch. Co. — —
Sandy Hill Iron & Brass Works — —
Seaboard Air Line R. R. Co. — —
Shartle Bros. Machine Co. — 21
Shell Oil Company — —
Shuler & Benninghofen — —
Simonds Saw & Steel Co. — —
Sinclair Refining Co. — —
Smidth, F. L., & Co. — —
Sirrine, J. E., Co. — —
Smith, A. O., Corp. — —
Smith & Winchester Mfg. Co. — —
Socony Vacuum Oil Co., Inc. — Back Cover
Sonoco Products Co. — —
Stebbins Engrg. & Mfg. Co. — —
Stowe-Woodward, Inc. — —
Sun Oil Co. — 6
Sutherland Refiner Corp. — —
Swenson Evaporator Co. — —

T

Taylor Instrument Cos. — 51
Taylor Stiles & Co. — —
Tennessee Coal, Iron & R. R. Co. — —
Testing Machines, Inc. — 43
Texas Co. — —
Texas Gulf Sulphur Co. — —
Thiele Kaolin Co. — —
Thomas Paper Stock Co. — 49
Thwing-Albert Instrument Co. — —
Timken Roller Bearing Co. — —
Titanium Pigment Corp. — —
Torrington Corp. — —
Towmotor Co. — —
Tracerlab, Inc. — —
Tyer Rubber Co. — —

U

United Carbon Co., Inc. — —
United Clay Mines — —
United States Steel Export Co. — —
United States Steel Supply Co. — —
U. S. Rubber Co. — 8
U. S. Steel Co. — —

V

Valley Iron Works Co. — —
Vanderbilt, R. T., Co. — —
Vapo Systems — —
Virginia Smelting Co. — —

W

Waldron, John, Corp — —
Walker Process Equipt. Co. — —
Walworth Co. — —
Warren Steam Pump Co. — —
Waterbury Felt Co. — —
Weber, H. G., & Co., Inc. — —
Wellman Engineering Co. — —
Westinghouse Electric Corp. — —
West Virginia Pulp & Paper Co. — 45
Weyerhaeuser Timber Co. — 45
Whiting Corp. — —
Williams Gray Co. — —
Wolverine Equipment Co. — —
Wyandotte Chemicals Corp. — —

BUSINESS STAFF

Arthur E. Gordon, Business Mgr.

Francis J. Gordon
15 West 47th Street, New York 36, N. Y. Plaza 7-2370

H. K. Vinton
CHICAGO, 3, ILL.: Room 1020, 79 West Monroe St. CEntrol 6-2784

Frederick B. Grosse, Production Mgr.

George Heitzeberg
15 West 47th Street, New York 36, N. Y. Plaza 7-2370

H. L. Poulton
PITTSBURGH, 11, PA.: 610 Pennridge Road, Hemlock 1-1571

McDonald-Thompson Company
SAN FRANCISCO, CAL.: 625 Market St., YUkon 6-0647

LOS ANGELES 5, CAL.: 3727 West Sixth Street. DUnkirk 7-5391
DENVER 2, COLO.: 222 Colorado Nat'l. Bank Bldg. MA 2733
SEATTLE, 4, WASH.: National Bldg.—ELliott 3767
HOUSTON, 6, TEXAS: Room 214, 3217 Montrose Blvd., LYnchburg 6711

Georg J. Linder, Frankfurt a Main, Wittlesbacher Alle 60, Germany — Telefon 46372

While we strive for accuracy in preparing the above index which is purely a service to our readers, we cannot be responsible for errors.

HUGHES PRINTING CO.
EAST STROUDSBURG, PA.

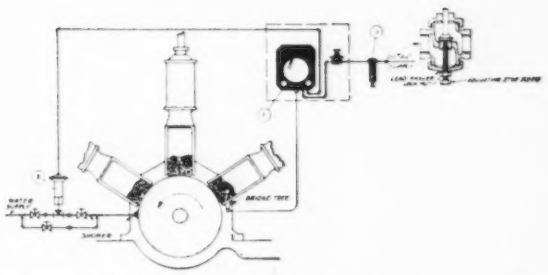
Taylor control keeps its nose to the grindstone

AND that's why it's so successful in detecting temperature variations in the groundwood. Location of the thermal element is all important to the successful operation of Automatic Temperature Control for wood pulp grinders, and Taylor has developed systems that are adaptable to all types—Pocket, Hydraulic Magazine, Continuous Magazine, Semi-Magazine, or Rotary Continuous.

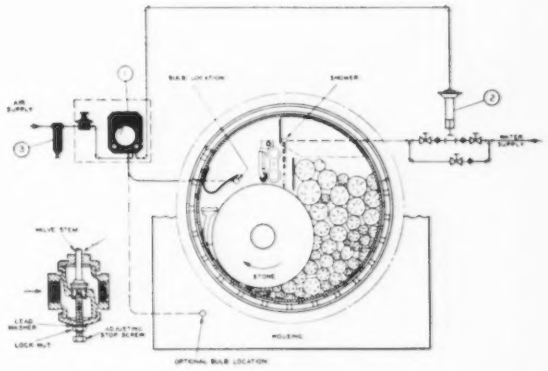
In the Taylor system the temperature sensitive bulb is located where it receives a constant shower of stock thrown from the stone by centrifugal force. It extends across the entire width of the stone, and the vapor-filled thermal system responds to the hottest spot across its face. Temperature is controlled by a Taylor FULSCOPE* Recording Temperature Controller which throttles a valve in the shower water supply line. This simple, practical system conserves stone life by preventing excessive temperature rises; increases production by maintaining the maximum temperature consistent with the pulp quality desired; decreases power consumption by over 6% per ton; relieves the operator for other duties.

This is just one phase of paper manufacture where Taylor controls are doing the job better, faster and more economically. Your Taylor Field Engineer will be glad to advise you on your problem—or write Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, flow, liquid level, speed, density, load and humidity.*

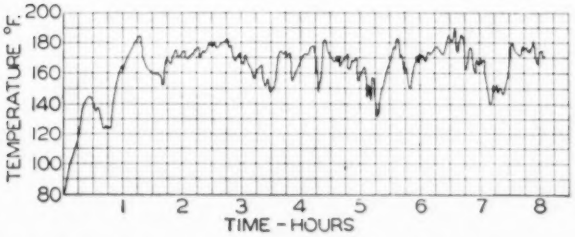
*Reg. U. S. Pat. Off.



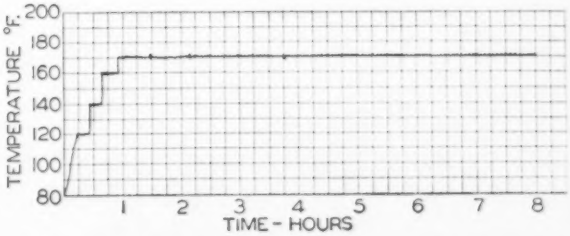
Pocket Type Grinder, showing location of bulb under bridge tree.



Rotary Continuous Type Grinder. Bulb installed underneath and at end of deflecting plate.

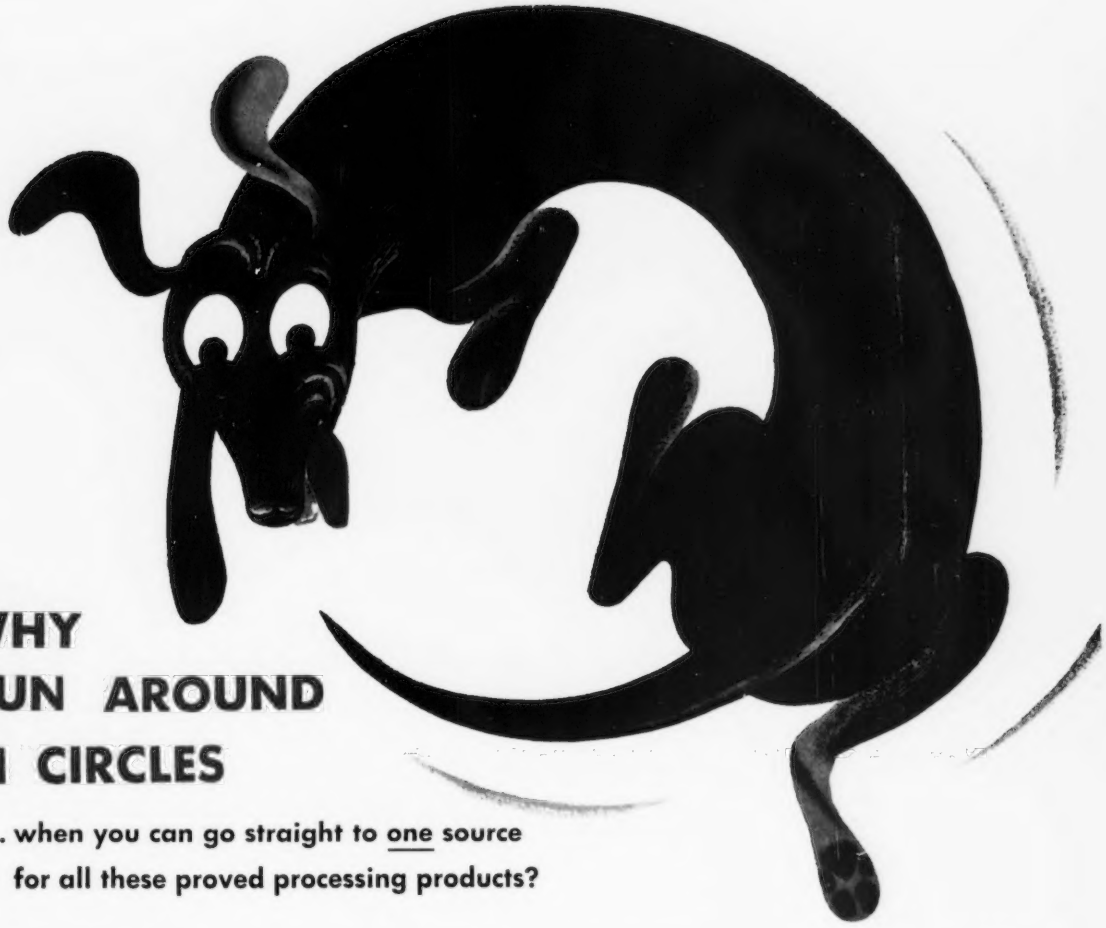


A typical plotted record of hand controlled grinding temperatures. Note rapid fluctuations, causing stock to vary in color, freeness and tensile strength.



Taylor Control holds grinding temperature within an average of ±1°F. Stone temperature can be brought up as gradually as desired after a shutdown by simply resetting control point.

Taylor Instruments MEAN ACCURACY FIRST



WHY RUN AROUND IN CIRCLES

. . . when you can go straight to <u>one</u> source for all these proved processing products?

Every one of these quality paper processing products can help you make better paper at lower cost. Check this list and see how many *you* can use. Then, call your Socony-Vacuum representative.

WAX EMULSIONS—*S/V Ceremuls*—improve sizing efficiency, impart desired characteristics to finished products. Applied in beater or as top sizes.

SPECIAL TREATING OIL—*Prorex Oil M*—excellent for impregnating uses, such as pork loin wrap, delicatessen papers.

SOVAWAX — *S/V Sovawax 100 Series* — assures strong bond, resists fracture upon bending at low temperature. Ideal for all types of laminated papers.

PITCH CONTROL — *S/V Sovalent 911* — plasticizes pitch in digester. *S/V Sovalent No. 21* — for cleaning wires, felts — reclaiming asphalt, wax broke.

SULPHUR CHEMICALS— *sodium sulfide solutions* — petroleum provides an extremely economical source of sodium sulfide for the Kraft process.

DEFOAMANTS— *S/V Foamrexes* — highly effective in solving foam problems throughout mill. Proved successful in scores of pulp and paper mills.

PARAFFIN WAXES— *highest quality.* With them, you get fast service everywhere — complete technical assistance.

SOCONY-VACUUM

Process Products

process products

SOCONY-VACUUM OIL CO., INC., 26 Broadway, New York 4, N. Y., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP.